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ABSTRACT

A seminar on special libraries and their role in national development was held as a pre-session before the IFLA conference in 1986. Papers presented include: (1) "On the Problem of Document Delivery in the Field of Science and Technology in Asia" (Daxun He, People's Republic of China); (2) "The Planning and Development of Special Library and Information Services, with Special Reference to the Asian Situation" (Nimala R. Amarasuriya, Sri Lanka); (3) "The Importance of Continuing Education and Prospects in Asia" (Liannie K. Daywin, Indonesia); (4) "National and Regional Networks for STI-ASTINFO" (Carmelita M. Martin, Philippines); (5) "General Modern Technology and Its Promise for Special Libraries" (Suwakhon Phadungath, Thailand); (6) "Problems of Collection Development in Science and Technology Libraries" (Mohammed Khurshid Alam, Pakistan); (7) "Evaluation of Special Libraries and Information Centres in Asia" (C. Deenadayalu, India); (8) "Modern and Innovative Concepts in the Organization and Management of Special Libraries and Information Centers" (David R. Bender, United States); (9) "The Optical Disk Pilot Program at the Library of Congress" (Joseph W. Price, United States); (10) "Developing Computerized Library and Information Services in Developing Countries--The Problems and Possibilities" (Ke Hong Park, Korea); (11) "The Importance of Patent Information and Its Implication for Developing Countries" (Vincent Choong, Malaysia); (12) "Towards Productivity Gains--The Role of High Technology, Abstracting and Indexing Services in National Development" (Rosdi Sundusia, Singapore); (13) "Regional Information Networks in Latin America--Can They Survive?" (Julio Cubillo, Chile); (14) "Information Analysis Work and Its Implications for Dissemination and Documentation of Scientific and Technical Information" (Suaesi Valasi, Western Samoa); (15) "Information for Development, Concepts and Resources" (Takayasu Miyakawa, Japan); (16) "Total Library Information System with Multi-Language Processing" (T. Kuragano, Japan); (17) "Introduction to the KIT (Kanazawa Institute of Technology) Library Center--Its Concepts and Methods" (Yoshiyuki Kawata, Japan); (18) "The Importance of Technical Information in Industrial Development" (Yukio Nakamura, Japan); and (19) "Status and Prospects of Special Librarians and Information Specialists in Asia" (M. Shamsul Islam Khan, Bangladesh). (KM)

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PRE-SESSION SEMINAR TOKYO 1986

Special Libraries and their role in National Development

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PRESESSION-1-E

On the Problem of Document Delivery in the Field of Science and Technology in Asia

by

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On the Problem of Document Delivery in the Field of Science and Technology in Asia

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Construction of a country relies on the development of science and technology. Biomedical science occupies a significant part in the whole scientific and technological field; its development plays a direct and highly important role in ensuring health, bringing about a prosperous economy and bringing benefit to mankind.

Since 1949, for 37 years medicine and medicinal career in China has developed rapidly. Acute and chronic infectious diseases and parasitic disease have been evidently controlled, epidemic prevention and maternity and child health care, highly strengthened. People's lifespan has prolonged from 35 in 1949 up to 67.9 years in 1985. In the course of prevention and cure of diseases as well as in that of elevating people's health level, medical and medicinal sciences have played an important role and gained prominent progress. China, however, is still confronted by most serious diseases that impair human health, such as cancer, cardiovascular and cerebral vascular diseases etc. therefore, to keep on controlling infectious diseases, to strengthen family planning and to promote health care for the people are to be undertaken as a main task. There are 39 countries and regions in Asia with a population amounted to 60% of that of the whole world. They have many similar problems and all of them are eagerly desirous to develop medicine and build up their countries. For this reason, to enhance information exchange between Asian countries in the field of medicine while setting up a better document delivery network remains a problem worthwhile putting on the agenda.

As is known to all, "Medical Literature Analysis and Retrieval System (MEDLARS)" developed by the National Library of Medicine, U.S.A. has already been a biomedical document retrieval system generating international influence. There are currently more than 2500 U.S. users and half again as many in other countries served through 14 MEDLARS centers outside U.S. Egypt recently opened its Center. There were 2.8 million searches in 1985, with 70% of them against the MEDLINE data base.(1)

The Institute of Medical Information (IMI) and the Health Sciences Library (HSL) of the Chinese Academy of Medical Sciences (CAMS) as the Biomedical Information Center of China, under the support of WHO, the National Library of Australia and the Australian Health Department library, and the U.S. NLM, have, since 1983, begun to provide MEDLARS off-line retrieval and SDI services to units concerned and professionals in China, being deeply welcome by users. In 1985 applicant units for off-line retrieval came up to 100, increasing 29.9% more than 1984 (77 units); topics amounting to 925, showing an increase of 56.3% (592); 159 units being served in 1985 (whereas 84 units in 1984, 89.2% increase), 2,822 topic times of SDI provided (2,208 in 1984, an increase of 27.8%).(2) Again in 1985, the Library of the Chinese Academy of Medical Sciences duplicated 19,856 articles of literature for 29 medical and medicinal units of various levels, provincial, municipal and autonomous regional and 170 articles for above-mentioned units, which then were not available in China.(3) The above figures indicate the demand of Chinese medical and medicinal professionals; this, in a certain degree, reflects the influence of MEDLARS upon China.

MEDLARS covers about 3,000 biomedical journals from all the world, being undoubtedly a considerably authoritative data base. But it must be pointed out that only a few Asian journals are selected and indexed. In 1983, as a component section of MEDLARS, the Index Medicus indexed 2,709 journals titles from 71 countries, of these about one-third are U.S. or Canadian journals; most of the remainder are titles from 29 European countries. A total of 89% of the titles indexed are thus North American or European periodicals, while those of Asian countries and regions do not come over 10%.(4) Take Chinese periodicals as an example, MEDLARS has now selectively indexed only 31 titles of Chinese biomedical periodicals, making up only 10% of the total publication of whole China, including national, provincial, municipal and autonomous regional levels. Only 15% of the Southeast Asian medical periodicals are indexed in the Index Medicus.(5) For this reason, MEDLARS cannot satisfy Asian countries simply by going through MEDLARS data base, especially biomedical exchange needed by developing countries in Asia.

Fortunately some Asian nations have realized the importance of establishing national medical document data base and made efficient efforts. India has edited "Index to Indian Medical Periodicals"(6) is going to create a data base for Index to Indian Medical Literature on the basis of MEDLARS system;(7) Indonesia, "Indonesian Index Medicus"(8) and the Philippines, "Philippine Index Medicus".(9) The South-East Asian nations have organized a "South-East Asian Medical Information Center", setting up a data base called "PERIND". From it, people can locate articles on a particular topic in Singapore or Malaysia since 1982 through online system.(10) India has also built up a data base on medicinal plants research.(11)

Under national support, the IMI, CAMS has already installed an

IBM 4361 mini-computer. The 2nd-stage training programme of using ELHILL personnel is to concluded this August. Trial running of MEDLARS tape will be put into effect very soon. Simultaneously, the IMI, CAMS is organizing capabilities to establish "China Biomedical Literature Data Base" according to the fundamental principles of MEDLARS system. As soon as the objectives of these two main items are carried out, it will notably improve medical document delivery in China and information exchange between Asian countries as well.

We are willing to exchange ideas about the transmission work of medical document in Asia with participants in this conference and make suggestions as follows:-

1. To establish and improve the national biomedical literature data base;
2. To set up the data base according to the fundamental principles of MEDLARS system, so that it will be internationally compatible;
3. To exchange tapes of each data base and provide documents duplicating service under the terms of mutual benefit;
4. To appoint a focal point as a liason unit undertaking relevant tasks;
5. To hold regular meetings discussing relevant policy.

HSL, CAMS has recently searched and duplicated a lot of medical literature for the Democratic Republic of Korea, Zimbabwe etc. In China, before and after the setting-up of MEDLARS center and China Biomedical Literature Data Base, the Institute of Medical Information and the Health Sciences Library of the Chinese Academy of Medical Sciences are willing to search or duplicate Chinese biomedical literature and provide MEDLARS retrieval service for other Asian countries.

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Special Libraries and their role in National Development

112

PRESESSION-2-E

The Planning and Development of Special Library and Information Services, with special reference to the Asian situation

by

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ABSTRACT

The Planning and Development of Special Library and Information Services, with Special Reference to the Asian situation.

Nimala R. Amarasuriya

Inspite of the vital need for information for all socio-economic development, very few developing countries include the planning and development of special library and information services in national development plans. Specialized information facilities and infrastructures are inadequate in many Asian countries. Because of the vast range of needs that have to be met, the future growth of specialized information services in Asian countries requires careful planning. The planning process requires a definition of objectives of the service and the designing of an operational strategy to attain these objectives, efficiently. Plans should include provision for periodic evaluation and assessment. The Sri Lanka Scientific and Technical Information Centre was developed from a small special library within the National Science Council into the National Scientific Documentation and Information Centre under a 5 - year UNDP Project Plan. Although the plan has proved very successful, several problems remain which are analogous to problems facing many other Asian countries. Recommendations to improve the development of special library and information services in the Asian region are outlined. The information profession and policy-makers should recognise the urgent need for planning and developing special library and information services and the vital importance of integrating these plans into national development plans.

1965

THE PLANNING AND DEVELOPMENT OF SPECIAL LIBRARY AND INFORMATION SERVICES, WITH SPECIAL REFERENCE TO THE ASIAN SITUATION

Nimala R. Amarasuriya

The resources of special library and information services are an important source of national wealth. No productive activity can be carried out successfully today in any field of research of socio-economic development unless adequate provision can be ensured to obtain relevant and uptodate information. Information is not merely an essential resource for effective research and development (R & D) but it is also necessary to ensure the optimal allocation and utilization of all other resources. By providing access to specialized and technical information, special library and information services enable professionals to keep abreast of advances in knowledge in their respective fields and also feed industrial and agricultural systems with vital information. When we consider the phenomenol growth of knowledge especially in science and technology (S & T) in recent decades, this is a tremendous task!

Inspite of their crucial importance, very few developing countries include the planning and development of special library and information services in national development plans. The basic reason for this neglect is often a lack of awareness of the vital role and functions of specialized information services.

At the Meeting of Experts on the National Planning of Library Services[1] held at Quito, Latin America, in February 1966, the functions of special libraries were defined as follows: "To provide the institutions they serve with the facilities they need for their specialized studies and research".

An information service performs various interrelated functions, including the collection and analysis of data, its storage and retrieval and its dissemination to user groups.

To carry out these functions, institutional and other arrangements for collecting and storing information for quick and efficient retrieval are essential. Facilities for the dissemination of stored information to various end-users have also to be provided. These facilities can range from simple traditional methods of document storage and delivery to complex computerized on-line systems. Today's Special Libraries cover an enormous range of subjects, from very broad to extremely specialized areas. Not only are materials such as books, periodicals, etc, essential, but suitable and adequate buildings, skilled professional staff and efficient information-processing equipment are required to meet a variety of demands.

The advanced 'western' world has realized that the exponential increase of knowledge demands a more systematic and planned approach to the provision of information. These countries are investing very large sums of money in developing their special library and information services.

While recent technological advances have brought about major developments in the advanced countries, facilities in many Third World countries have not changed significantly during the past two decades. Although it is now established that information services are essential for socio-economic development, only a few underdeveloped countries have planned to coordinate and to put to maximum use the resources of their special library and information services.

A common problem in most Third World Countries is not only a dearth of research but also poor transfer of existing data, not only from foreign sources but within a country, as well. Even in the advanced countries, with good library and information facilities, unintentional duplication of research is responsible for over one-tenth of expenditure on R & D. How much more will unnecessary duplication of research cost in the Third World Countries if access to specialized information is lacking?

The future growth of special library and information services has consequently assumed major and increasing significance for the developing countries. Planning and development of information services in the advanced countries where considerable services already exist, is concerned mainly in developing existing services and filling gaps but the problems of planning information services in the Third World are of a completely different nature.

The Asian Situation

One of the main challenges in planning specialized information services in the Asian Region is because of the vast range and magnitude of the needs that have to be met. Asia covers a wide spectrum of countries and has the largest population of all the regions. The countries differ considerably in their overall economic level but most have a low GNP per capita. Associated with the factors of underemployment, unemployment, illiteracy and high incidence of poverty is a pressing need for socio-economic development.

Agriculture continues to be the mainstay of many of the national economies but during the past 20 years, many Asian countries have sought to develop their industrial sectors. This widening of the industrial sector calls for increased attention to the choice and adaptation of appropriate technologies. This in turn needs constant access to current, technical information. Because of the considerable multiplicity of situations and needs within the Asian Region, the requirements for technical data are extremely varied and complex, and necessarily cover a wide spectrum of end-users.

Any classification of the Asian countries tends to be fairly arbitary since several countries fall under different country groups with respect to particular factors and aspects. In the low-income countries (Bangladesh, Nepal, Sri Lanka) development efforts are directed towards meeting basic needs of the most deprived sectors of the population and the main thrust is on improving agricultural production. The middle-income countries (e.g. Korea, Singapore) stress on accelerated industrialization and increased use of higher technologies. The industrialized countries like China and Japan assign priority to agricultural self-reliance and the rational use of the natural resources necessary for their industrial power.[2]

It is against this background of current trends in development and the increasing demand for information in the Asian Region, that the present need for the growth of special library and information services should be considered. The problem of the information gap in the Third World has been identified repeatedly at several Asian Regional meetings convened to deliberate on regional aspects of development during the last two decades. At the UNESCO Meeting of Experts on the National Planning of Library Services in Asia[3] held in Colombo, Sri Lanka, in February 1967, a long term plan for library development in Asia with a general target for 1968-83 was drawn up. In general, the situation was agreed to be very unsatisfactory and the meeting held the view that planned organisation of library services was necessary for any further development to be achieved. It was decided that "Special libraries should be modernized and developed according to present and future requirements .... Considering the rapid development of both agriculture and industry, libraries and information centres should be set up where necessary to provide information to assist in the development of these two sectors".

At the Conference on the Application of S & T to the Development of Asia (CASTASIA) held in New Delhi in August 1968, the following resolution was passed: "Recommends that UNESCO provides its technical assistance to countries of the Asian Region upon their request in building up their S & T information services and to extend the responsibilities of existing science documentation centers to all fields of technology ...."

The Report on the UN Conference on Science and Technology for Development (UNCSTD) Seventh Session of the Intergovernmental Committee held in 1985 in its Mid-Decade Review, commented that with respect to the Asian Region[4]: "The existing situation in developing countries regarding national information institions, systems and facilities is characterized by considerable diversity in institutional facilities and infrastructures and in the degree of usage of information ..... Present day information technologies have been introduced in some Asian countries though in most of them, there is continuing dependence on traditional and conventional methods of collection and dissemination of information. Institutional facilities such as libraries and documentation centers are inadequate ..... information falls short of the requirements of various user groups. Although progress has been achieved in the information field since 1979, it has been fragmentary and unsystematic." The UNCSTD Advisory Committee therefore emphasized, first and foremost, the building up of national capabilities and infrastructures to ensure the utilization of accessible information by the relevant end-users.

The development of national information services and capability in the Asian region, in view of its importance and complexity, requires careful planning. Only through systematic planning can modern concepts in library service be established effectively.

The Planning Process

The planning of library services is itself a relatively new concept and no definite methodology has yet been evolved to assist and guide those responsible for the process of planning. Yet, a well-defined methodology for the planning of library services has become essential if they are to gain the support they need to be integrated into overall national development plans.

Planning basically, means studying the aims and objectives of library services, estimating financial costs and determining user needs in relation to the particular institution or enterprise. The essential elements in the development of the information service have to be studied, including : major user groups, the nature and type of information required and the need for coordination and cooperation with other information services. Policy issues can be drawn only on the basis of these factors. Planning does not necessarily mean centralized control but rather coordination and cooperation for the maximum utilization of available resources. Without planning, libraries and information services will remain poorly organised and equipped, lacking a clear definition of their roles and objectives. They will also be unable to obtain much needed financial support from governments and funding bodies.

Planning is therefore not an end in itself, but a means of achieving agreed objectives and goals. It should also be a constantly evolving process which must be evaluated and revised with respect to changing situations.

Planning must consider the alternatives, forecast their impact with due regard to the limited resources available, propose realistic ways of applying the chosen strategy and check and evaluate the result.

The planning of library services demands a partnership between planners, policy-makers and senior librarians and information scientists. The Colombo Conference decided that "a strong representative body is essential for coordinated and efficient library planning and development of all types of libraries in a nation".

Planning itself is in 2 stages : firstly a definition of the general and specific objectives and aims of the service and secondly, designing an operational strategy to attain the objectives efficiently and rationally. The preparation of a development plan requires the following : a review and analysis of past experiences and present needs; determination of requirements and financial implications; programming; execution and evaluation. The study of past experiences and analysis of present needs is often a complex task, rendered even more difficult by the lack of reliable data and statistics. This stage of planning should include a diagnosis of the needs and objectives of the institution concerned and their relation to general development plans. The nature and extent of local demand will have to be checked by consultation, surveys and controlled tests. The next stage is the determination of requirements and their financial implications. These needs and the financial implications will necessarily vary from country to country.

Current requirements will depend on the needs of the particular service within the constraints of human, technical and financial resources, the future will depend on the aims and objectives and on estimates of economic growth. Once needs have been studied and objectives defined, an operational strategy to attain them efficiently and rapidly within the limitations of human and material resources has to be prepared. The planner must estimate the time required for each of the planning operations. The plan, however, must never be definitive and provision should be made for periodic evaluation and assessment, and would have to be adaptable to changing needs of the parent institution.

The Development of a Special Library and Information Service

A typical example of a small special library in an Asian country that was planned and developed into a national scientific information centre is that of the Sri Lanka Scientific and Technical Information Centre (SLSTIC).

Sri Lanka, like many other developing countries, has been hampered in its development programs due to inadequate provision of information - especially S & T information. Inspite of substantial governmental investments in developmental programmes, especially in the agricultural and industrial sectors, the application of modern techniques had been hindered by the lack of necessary data. A survey carried out by the Ministry of Research and Housing in 1968, indicated more than Rs.23 million had been spent on R & D in the public and private sector but the existing libraries did not have adequate resources to meet the growing information demands of research workers. In October 1968, a feasibility mission was carried out by UNESCO to advise the government on the establishment of a national scientific information and documentation center. According to the UNESCO report[5] "Universities and special libraries in Ceylon (Sri Lanka) do not have collections large enough to supply the needs of their teaching and research programmes. This problem will become more acute with the development of industry in the country ....." The report also commented on "this retardation of development of specialized library services in the country when compared with development in other sectors ...." The expenditures on special libraries were very low (approx. Rs.350,000/= US $ 58,000) when compared to the desirable levels of expenditure recommended at the Meeting of Experts on the National Planning of Library Services in 1967.

The main problems and deficiencies in the existing services according to the Report were : the lack of adequate financial support for special libraries which consequently had inadequate resources; the dwindling foreign exchange reserves and poor utilization of even the available funds; poor communication links resulting in lack of coordination between libraries which therefore tended to develop in isolation; lack of trained library personnel and a severe shortage of equipment e.g. reprographic facilities, etc.

In February 1976, Cabinet approval was given for the establishment of a national scientific documentation centre within the National Science Council of Sri Lanka, now named the Natural Resources, Energy & Science Authority (NARESA), A Project agreement for developing the NARESA library with UNDP aid was signed by the Government and UNDP in 1977. Under the UNDP Project agreement,[6] provision was made for a 4 year project (SRL/77/004) from 1977 to 1981, with a total UNDP contribution of US $ 364,064 and a Government contribution of Rs.1,157,300. The UNDP funds were to be used for equipment and training and the Sri Lankan Government was expected to provide buildings and staff. UNESCO was appointed as Executing Agency and NARESA was the Government Implementing Agency. The project was subsequently extended for another year ending in 31st December 1982. The main objectives of the Project were to provide: -
(a) a central documentation centre enabling access to recent and relevant S & T documentation and (b) the interlinking of existing scientific libraries and information centres into a network of interrelated institutions which could jointly switch information to the community of users.

NARESA's library was expanded and re-designated the Sri Lanka Scientific and Technical Information Centre (SLSTIC) in 1978.

During the 5-year duration of the Project, two consultancy missions were carried out. The first mission, from December 1978 to February '79, was to advise on the development of information services at the Centre. The second mission was carried out between December 1982 and January '83, to evaluate the progress made by the project and to recommend measures for the future development of existing services and the introduction of new ones.

Several fellowships were granted, under the Project's Training programme.

The chief Librarian, 3 Documentalists and 4 Library Assistants and the Reprographic Technician were sent abroad for specialised training. Equipment, which constituted the major UNDP input was purchased giving preference to local requirements.

The present activities of the Centre include : Library services, documentation and information services, Publications Division, provision of audio-visual, reprographic and printing facilities, computerized services; education and training programmes for library personnel and users, cooperative networks and programmes at the national level and linkage with regional and international information systems and services.[7]

One of the most important achievements of SLSTIC is the formation of national cooperative networks and programs. Special libraries in Sri Lanka which previously developed in isolation have been linked by the Sri Lanka Scientific and Technical Information Network established in 1979 with SLSTIC as the focal point. SLSTIC provides interlibrary loans, reprographic, audio-visual and other technical services to the member libraries. A Cooperative Acquisition Plan for the expensive, but essential abstracting journals, has been developed among the member libraries. Within SLSTINET, a number of sub-systems in specified areas i.e. agriculture, health and energy have been established.

One of the main deficiencies of special library services in Sri Lanka was the lack of information on the holdings of existing libraries and the consequent duplication of material and budgetary wastage. To fill this gap, a cooperative programme was initiated by SLSTIC to compile a Union Catalogue of S & T Publications and a Union List of S & T Periodicals. These provide efficient tools for library cooperation by promoting and facilitating inter-library lending, preventing duplication and aid in rationalising acquisition policies.

With the objective of developing qualified manpower resources, SLSTIC organises both short-term and long-term training programmes for library personnel and users on specific topics in library science. Special attention is paid to ensure that the programmes are adapted to suit local needs.

SLSTIC has from its beginnings as a small special library expanded its activities not only at the national level but also to regional and international levels. As envisaged in the original Project Plan, links have been forged with many regional and international information systems in order to gain access to foreign literature as well as to ensure that data on local research is disseminated abroad. SLSTIC is the local liason centre for the Commonwealth Renewable Energy Resources Information System (CRRERIS) and also for the U.S. National Technical Information Service (NTIS). These links provide SLSTIC with access to their databases. SLSTIC also maintains links with the Regional Network for the Exchange of Information and Experiences in S & T in Asia and the Pacific (ASTINFO) and the Regional Information Network for South and Central Asia (RINSCA).

Problems and Constraints

A comparison of the SLSTIC services and facilities with the requirements of the scientific community showed that the services provided are in line with user needs. The SLSTIC Project has had far reaching and extremely valuable effects on the provision of specialized information in the country. Inspite of considerable change and marked improvements, basic problems of information provision in a developing country remain.

1. One major problem (a chronic one in many Third World Countries) is the inadequacy of financial resources. Allocations for special libraries are extremely small by 'Western' standards.

2. The establishment of cooperative activities and information networks for

resource-sharing has proved to be very useful. Successful cooperative activities however depend on the use of standardised procedures in bibliographical data processing. This requires professionally trained staff.

3. The shortage of professionally trained staff is a major constraint in the development of information services. Library personnel . lack sufficient opportunities for training at all levels and especially to cope with the demands of the new information technologies.

4. A lack of awareness among the user community of the existing facilities and services.

5. A major constraint in the lack of data regarding potential user needs, manpower requirements, information technology use and requirements, etc.

6. A lack of provision for specialized services to reach the rural community who constitute 80% of the population.

Many of these problems are common to other Asian Countries. In several countries, financial resources and the shortage of trained staff are the two main constraints that fix the limits within which library services must operate. In many Asian countries, technical literature is inadequate or not available in the national languages. Document delivery systems also vary a great deal in speed and cost of delivery. There are significant difficulties and delay in acquiring foreign literature, especially S & T journals, books and other materials, mainly due to the shortage of foreign exchange. The use of foreign data banks is often limited because of difficulties in indexing and language. Information services in some Asian countries have access to foreign data banks. However these are mainly situated in the advanced 'Western' countries. Due to the large number of languages used within the Asian Region (and sometimes within a single country) information from the regional countries is limited to that which is published in the European languages, mainly English.

The present situation regarding the development of information services in the Asian region thus presents a number of problems and constraints. Planning is hampered by a number of factors : (a) appropriate methodology for planning in the Asian context has not been developed (b) necessary statistical data are not available (c) librarians often lack a knowledge of planning methodology.

Recommendations for the Future

To remedy these shortcomings, I have outlined a few recommendations regarding future needs to improve the planning and development of special library and information services with special reference to the Asian situation.

1. Education in planning methodology as it relates to library and information services should be provided for senior librarians and information specialists. Post-qualification instruction in planning techniques for experienced librarians would facilitate communications with policy-makers and administrators to develop specialized information services and make them active participants in the planning process.

2. Greater coordination and rationalization of resources should be provided. The less-developed countries, especially, must ensure that special libraries do not develop in isolation. Interlinkage could be provided through focal points which should prescribe guidelines and develop appropriate mechanisms and procedures.

3. The provision of information services must be based on surveys and studies of the information requirements of the user community. Research on man-power studies, user needs, technology requirements, etc, is being given great importance in the advanced countries. The findings of such research conducted within the Region could act as an important control mechanism for future planning of library services.

4. A review of existing special information services and facilities in each Asian country should be undertaken and an assessment made of the extent to which existing services are being used. Data collected would be very useful to study appropriate methods of library planning in the Region.

5. The building up of national capabilities and infrastructures in the less-developed regional countries for the effective use of computerized information systems and data bases. Increased automated facilities in the region should encourage the growth of national data banks and more efficient organisation of information through standardization. Though equipment costs are decreasing, the initial and maintenance costs are high and therefore it would be necessary for the less-developed countries to build-up these facilities in a phased manner depending on resource constraints.

6, Traditional, non computerized facilities will continue to be used in most of these countries, It would therefore be necessary for each country to determine an appropriate mix of conventional systems and modern information technologies.

7. Specialized training programmes at all levels will be vital, and should be given high priority in the planning of library services, to prepare information professionals for national roles in development. Training programmes to promote the education of scientists, engineers and other users in the more efficient use of special libraries and information services, too, are essential.

8. Information services must be suitably oriented to meet the needs of the different user groups within each country. Specialized information should extend to the non-metropolitan and rural sectors which constitute the greater part of the population. There is also a need for greater sensitization at all levels regarding the vital role of information services and a greater appreciation of the significance of such information. Various measures are required to stimulate demand for and use of such information.

9. The development of national information services in the Third World will require greater international cooperation and assistance, and the implementation of programmes of bilaterial and multilateral assistance for this purpose. Technical assistance programmes should cover the selection of equipment, promotion of specialized training programmes for local staff, development of software as well as for the establishment of bibliographical linkages at national, regional and international levels.

Conclusion

It is important to emphasize that, given the wide heterogenity in the Asian Countries, no uniform or standard model for the planning and development of special libraries and information services can be prescribed. There should be a great deal of flexibility in planning of such systems, leaving room for adjustment to change depending on various country situations and levels of development. It is important also that any expansion or growth of information facilities should build on existing institutions and should cover gaps in information provision according to national priorities. What is most important is that the information profession, as well as decision-makers at the highest level, should recognise the importance of planning and developing special library and information services and the vital necessity to integrate these plans into national development plans.

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PRE-SESSION SEMINAR TOKYO 1986

Special Libraries and their role in National Development

127-PRESESSION-
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The Importance of Continuing Education and Prospects in Asia

by

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The Importance of Continuing Education and Prospects in Asia

Abstract

The development of communication and information technology for library application affects the needed skills for library and information personnels. Librarian and information specialists need to improve their skill and knowledge to support the development trend of information services. Some of the available continuing education programmes in Asia are presented.

Introduction

Librarianship has been practiced for many centuries, but rapid development in science and technology has changed the demand of library services that later grew into documentation and information work. The growing demnad is because of the fact that various types of printed, written or non-conventional documents have to be handled by the library and information profesionals in addition to the common types such as books and periodicals. The latest development is in the form of electronic.

The continous increase of published and unpublished documents, as a result of science and technological development requires the information professionals knowledge and skills in re packaged and consolidated of information for a specific purpose. To minimize the space for storing the documents, with the emergence of reprographic technology, microfich and microfilm activities become a current practices in information work.

The development of communication and information technology also affects the library and information work leading to international information network. Although the computer application for libraries already started in the 60's in the developed countries, it was not as well developed in some Asian countries.

It is recognized that not many libraries information centers can hire well trained librarians and information professionals. Librarians and information professionals in special libraries ussually compose of :

1. University graduates with subject background;
2. University graduates with library science background;
3. Highschool graduates.

Identification of needed skills

Three major types of training are needed to support the above trend of information services of special libraries.

1. Information services;
2. Information system;
3. Paraprofessional training in information handling.

The needed skills for information service personnels are:

1. Knowledge of subjects;
2. Knowledge of computer hardware and software and other new information technology for information and library application;
3. Knowledge of methods for handling bibliographic materials suchas abstracting, indexing, compiling bibliography etc;

4. Knowledge of repackaging and reviewing the information of a specific subject;
5. Communication skills;
6. Marketing skills;
7. Management skills.

The needed skills for information system personnels are :

1. Application of computer and new information technology for information management;
2. Capability to handle bibliographic materials;
3. Communication skills;
4. Management skills.

The needed skills for paraprofessionals practical experiences in information handling for supporting the library and information professionals.

The importance of continuing education

To develop the staff interest and skills which are essential for special libraries, library administrator must seek alternatives for the staffs to join the continuing education program related to the library needs and objectives. To provide a good quality services, librarians cannot depend on what was learned in library schools and what learned directly through work experiences.

An effective continuing education should contribute both to general professional growth and development of individual and also to an improvement in job performance.

Continuing education of library and information science in Asia

The majority of the existing library schools in Asia do not offer information science, communication and management courses to support the development of information services. Only a few library schools is offering continuing education such as :

1. Documentation Research and Training Centre (DRTC) Bangalore, India.[1/]
2. Shrimati Nathibai Damodhan Thachersey (SNDT) Women's University Bombay, India.[2/]
3. University of the Philippines. Institute of Library Science Quezon City, Philippines has been appointed by UNESCO to undertake the PGI (General Information Programme) to support the needs of information specialists in Asia.

The continuing education most often is offered by professional associations and/or potential libraries and information centers. Those are :

1. CONSAL (Conference of Southeast Asian Librarians) held regularly to provide continuing education programs to support the new trend of information system and services in Asia.[3/]
2. Asian Institute Library and Regional Documentation Center provides courses on computer application in libraries and new techniques of information handling for a periode of 3 months. This institute also offers training programs in computer application development to enchance the effective use of computers in meeting the library and information need in Asia. The programs provide training in the implementation

of practical applications and for raising the general level of knowledge and skills of Asian computer programmers and users.[4]

3. The National Library of Singapore with the Asean Training Award offer a practical training in library work.

Outside the library pofession there is a profusion possiblity to support the needed skills for better services in the areas not regularly be offered by the library schools. Korea Institute for Industrial Economics and Technology (KIET), Seoul, Korea and Ministry of Industry, Department of Industrial Promotion, Thailand both offer a special program for marketing information services based on special request.

Pursuing the continuing education outside the county needs external funding that sometime is offered by IDRC, UNDP, British Council and Colombo Plan etc. In addition it also required a minimum level of English profiency. Because of the limited fund and language problems, only a few librarians and information specialists are able to have experiences outside the country through library/information professional association workshop/conference/training. Those librarians and information specialists will be a potential trainor for educational activities of the local professional association. The conference/workshop/training of the local professional associations attract colleageous from the local areas. The educational advantaged of attending such programs should be obvious, not just from the content of the program but it also give opportunity for librarian and information specialist to contact with other people who might helpful in daily work.

Conclusion

Librarians and information specialists need to extend their knowledge not only in library and information science courses but also communication, management and their subject knowledge related to the development needs and objectives of the library within or outside the country.

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Special Libraries and their role in National Development

128-PRESESSION-4-E

National and Regional Networks for STI-ASTINFO

by

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NATIONAL AND REGIONAL NETWORKS FOR STI-ASTINFO

by

Carmelita M. Martin

Scientific and technological information (STI) has generally been recognized as an important means of ensuring maximum use of science and technology for socio-economic transformation by the countries in the Asian and Pacific region. As there has been unprecedented progress in science and technology, the exponential increase in the volume of the literature of these disciplines will slow down the flow of information thereon as a result of the phenomenon known as the "Information Explosion."

Countries in the region are aware that it is no longer profitable to adopt a "do-it-alone" policy as far as the management and services of STI in their respective territories is concerned. The unabated generation of a vast body of STI plus the economic constraints being experienced by these countries indicates an urgent need for the sharing of resources through co-operative networks.

What are networks ? The National Commission of Libraries and Information Science (U.S.) defines network as :

> Two or more libraries and/or organizations engaged in a common pattern of information exchange, through communications, for more functional purpose. A network usually consists of a formal arrangement whereby materials, information, and services provided by a variety of types of libraries and/or organizations are made available to all potential users...Computers and telecommunications may be among the tools used for facilitating communications among them.[1]

The need for an information network for science and technology has been the topic of many conferences over recent years. The United Nations Conference on Science and Technology for Development (UNCSTD),Vienna, August 1979, recommended the establishment of a worldwide network to expedite the transfer and flow of STI required to support the development activities in the developing countries. At the Second Conference of Ministers Responsible for the Application of Science and Technology to Development and Those Responsible for Economic Planning in Asia and the Pacific (CASTASIA II), held in Manila from 22 to 30 March 1982, delegates from participating countries - Afghanistan, Australia, Bangladesh, China,India,Indonesia, Malaysia, Nepal, New Zealand, Philippines, Sri Lanka, Thailand, USSR and Vietnam - strongly supported the setting up of significant cooperation on a regional level in order to promote access to and use of information by individuals engaged in various scientific pursuits and developmental activities. The Conference recommended "the creation of a scientific and technological network for Asia and the Pacific for the exchange of information and experience."[2]

Following up on this recommendation, Unesco initiated the ASTINFO project with the following as immediate objectives :

- to strengthen bibliographic control of the countries' own scientific and technological output and establish computer-based bibliographic data bases in subject areas of interest to the region supported by document clearing houses;
- to stimulate and promote the creation of non-bibliographic data bases in science, technology and socio-economic fields of importance to development in the region;

- to develop and promote the technical and organizational structures and capabilities for cross border exchange of data and for the sharing of processing facilities including the development of national networks and their interconnection to form a regional network ;
- to develop specialized information networks in high priority subject areas, strengthen the information base of existing networks in the field of science and establish networks for the exchange of expertise and knowledge in specific subject fields;
- to improve the national information infrastructure to meet the needs of the regional network so as to ensure that all those in the country who should benefit from the regional network have access to it;
- to strengthen one selected institution in each participating country to become a national node for the network and institutions of subregional/regional vocation to become centres for regional information services;
- to introduce improved/new information services in particular to promote subregional selective dissemination of information services based on data bases available in the region, develop access to data bases outside the region and improve information support, including consolidated and repackaged information for development;
- to train information specialists; and,
- to increase awareness among potential users promoting the use of existing systems and services, in particular those established by United Nations agencies, and to train users in the use of these services.[3]

From the above objectives, it is clear that the ASTINFO project is not only limited to the provision of convenient access to and use of information, but also aims to promote the exchange of experience, expertise and sharing of information processing facilities, including computer hardware, software and telecommunication lines. To accomplish this, ASTINFO has engaged in various projects and activities which will enhance the development and strengthening of national and regional data bases using advanced technology. The creation of specialized networks, the strengthening and reorienting of existing ones, and training of information service specialists for these facilities is part of the project, including the creation of a general framework for co-operation and systems linkages among participating countries.

ASTINFO recognizes the need to create a sound networking environment and the development of its professional and technical manpower component must be given preferential attention. The management of networks requires specific skills over and above those required to operate and administer individual libraries.

The development of meaningful regional science information system is hampered by the apparent shortage of qualified personnel. Thus, appropriate training, specifically in the field of information technology, should have to be provided to the traditional librarians and information workers in STI activities in their own countries. A major step in this direction is the holding of a "Postgraduate Training Course for Science Information Specialists in Southeast Asia" at the University of the PHilippines from 1978-1984. This six-year Unesco executed project co-sponsored by the Governments of the ASEAN member countries was funded by the UNDP.

A similar training course, the "Postgraduate Training Course in Information Studies" was started last year in China at the request of the Scientific and Technical Information of China (ISTIC). The development of training programs for information specialists include in-service training, study tours at management levels, participation in regional seminars and workshops, as well as participation in regional seminars and workshops, as well as participation at international conferences.

Among the problems encountered in providing information services are: inadequate data and methods of data collection, absence of computer facilities and insufficient control of locally generated STI. To correct this situation, ASTINFO has undertaken several projects and activities aimed at the development of the local and regional data bases through the computerization of data base activities and information services. The first half of 1985 saw the procurement of microcomputers and software packages for national and regional networks. The National Institute of Oceanography (NIO), Goa, India was provided with a microcomputer and software for its data system .The Pakistan Scientific and Technical Information Center (PASTIC) has also been given assistance to acquire a microcomputer for use in bibliographic work. With a view to improving its information services, the SEAMED/BIOTROP Library and Documentation Services, a regional network on tropical biological information based in Bogor, Indonesia, was also provided with a microcomputer together with data base management and word processing software.

ASTINFO's assistance does not end with the provision of computer hardware and software. It also sends consultant missions to implement its programs and provide training of local personnel in the use of the system.

A major programme area of ASTINFO is the creation of specialized networks in selected subject areas and the strengthening of the information base of existing national and regional networks in science and technology. These specialized networks are expected to provide information services in a specific field. (e.g.,medicinal and aromatic plants) or on a specific type of activity (e.g., research-in-progress). The services that will be rendered by a particular specialized network will be based on the specific needs of its user population groups and availability of information resources.

The Regional Information Network on Medicinal and Aromatic Plants (RINMAP) is a specialized network within the framework of ASTINFO. It was initiated in 1984 in collaboration with the Government of India. The Publications and Information Directorate (PID), Council of Scientific and Industrial Research, New Delhi, is the lead centre for the network. RINMAP aims to provide a framework for the development of cooperation among the participating countries so that their user communities can have access to and make optimum use of information in medicinal and aromatic plants, whether acquired from abroad or product of research and development activities in the region. The subject areas covered by this network are : chemistry, pharmacology, pharmacognosy, ethnomedicine, agrotechnology and other aspects of medicinal and aromatic plants. Some of the activities of RINMAP include the provision of information covering research carried out in other regions, publication of a newsletter and support for the training of information manpower. At the meeting of the

Interim Steering Committee held in Bangkok, Thailand, from 5-7 September 1985, participants from Australia, Hong Kong, India, Republic of Korea, Philippines, Sri Lanka and Thailand agreed to rename the network "Asian and Pacific Regional Information Network on Medicinal and Aromatic PLants." (APINMAP)

The Institutional framework of ASTINFO is shown in Figure 1. The ASTINFO coordinating Units (ACUs) and Liaison Officers are nominated by the governments of the Unesco Member States from the Asia -Pacific region. The Associate Centres and Associate Networks are, in turn, nominated by the Liaison Officers in cooperation with Unesco. The ACUs are tasked with the promotion of programmes and activities of the ASTINFO project and with liaison work between the project and other activities on the national, regional and international levels. The elaboration of the ASTINFO policy and the promotion and monitoring of the network development also fall under the responsibility of ACUs.

Associate Centres, on the other hand, are envisaged to do the following:

1. Provide short-term in-service or on-the-job training in specified fields to information specialists sponsored by other organizations in the country or deputized by institutions in other countries of the region.
2. Assist in arranging for the type of training mentioned under (1) in appropriate institutions in the country when requested for.
3. Organize workshops or seminars on specific topics under Unesco/ASTINFO sponsorship.
4. Undertake the preparation of information products and tools in the fields of its competence for use or for service in the network.
5. Undertake the processing of information and data that might become necessary in a cooperative network.

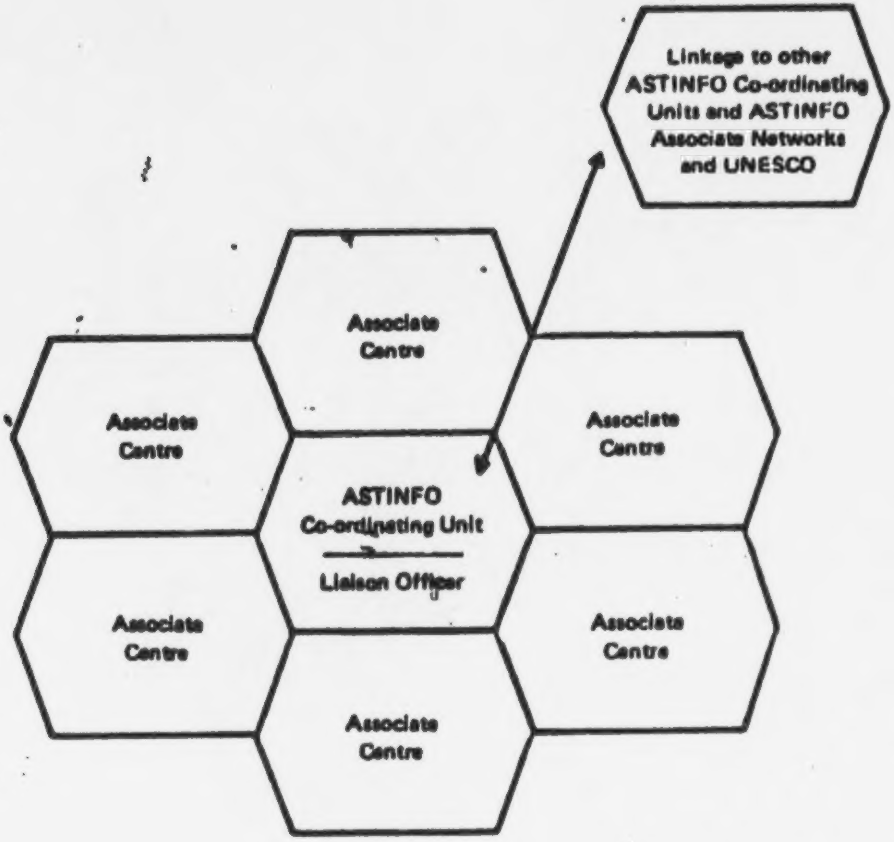
Linkage to other ASTINFO Co-ordinating Units and ASTINFO Associate Networks and UNESCO
Associate Centre
Associate Centre
Associate Centre
ASTINFO Co-ordinating Unit
Liaison Officer
Associate Centre
Associate Centre
Associate Centre

FIGURE 1
INSTITUTIONAL FRAMEWORK OF ASTINFO

6. Provide expertise when requested for to advise other institutions or implement specific activities within the network.

7. Serve as a centre for testing of software, norms, etc. in information handling.

8. Undertake to prepare newsletters or other bulletins to disseminate information about activities within ASTINFO.

9. Serve as a referral centre.[4]

An important component of ASTINFO's structure is the Associate Network (AN). An Associate Network consists of either a group of experts in specialized subject fields or network of institutions in special areas of science and technology. Within ASTINFO, this AN will be used as a venue for information dissemination. And its expertise on certain matters, like specialized information handling and the development of software packages will be tapped.

The Information Network on New and Renewable Energy Resources and Technologies for Asia and the Pacific (INNERTAP) is an associate network of ASTINFO. It is one of the five sub-regional information networks on New and Renewable Sources of Energy (NRSE) being supported by Unesco under its Global Energy Information Programme. INNERTAP is composed of China, Korea, Thailand and the Philippines (See Figure 2). In June 1983, the Philippine National Oil Company-Energy Research and Development Center (PNOC-ERDC) was designated as its Host Center.

INNERTAP's main objective is to improve the flow of NRSE information within, into and out of the Asia Pacific region. Specifically, it aims to :

- develop a computer-based bibliographic and numerical data bases and to set up a document clearinghouse;

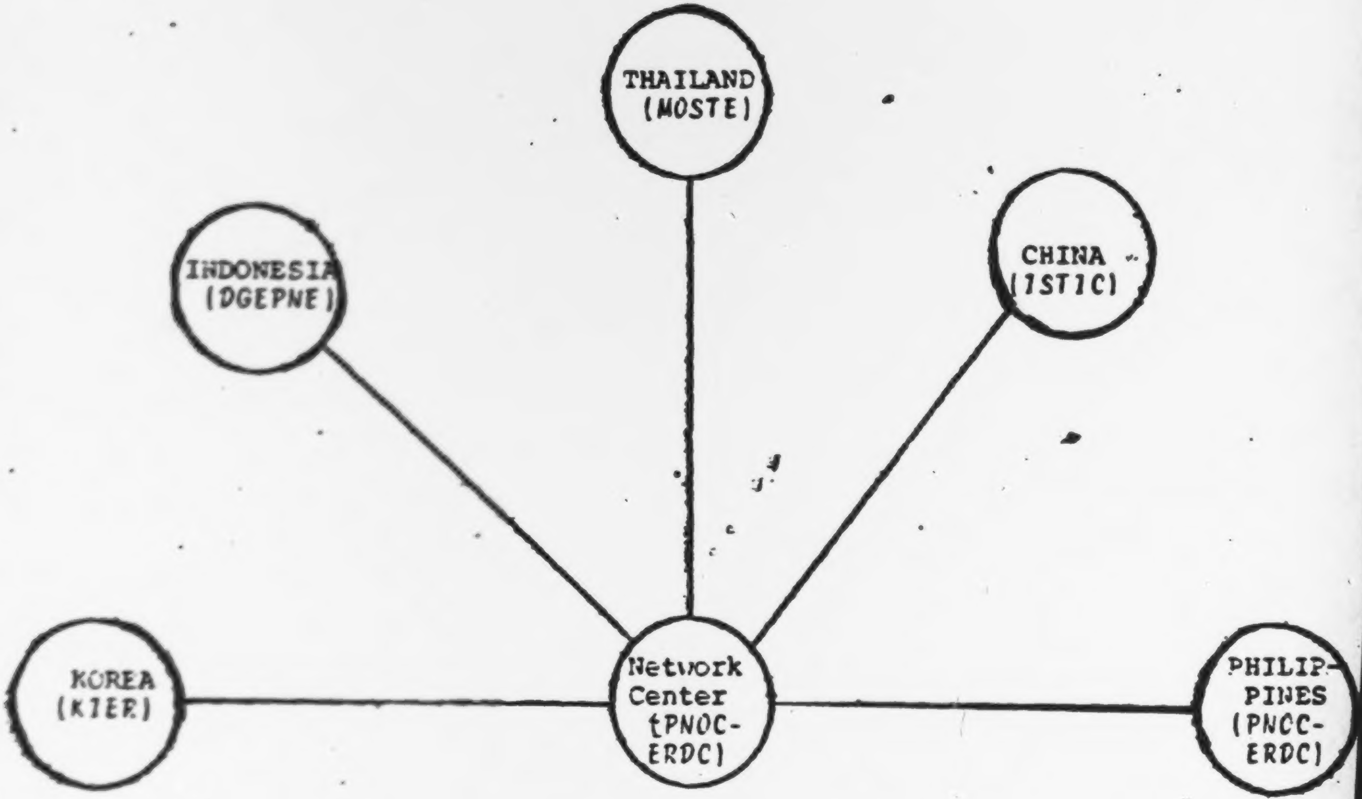
THAILAND
(MOSTE)
INDONESIA
(DGEPNE)
CHINA
(ISTIC)
KOREA
(KIER)
Network
Center
(PNOC-
ERDC)
PHILIP-
PINES
(PNOC-
ERDC)

FIGURE 2 : THE INFORMATION NETWORK ON NEW AND RENEWABLE ENERGY RESOURCES AND TECHNOLOGIES FOR ASIA AND THE PACIFIC (INNERTAP)

KIER -- Korea Institute of Energy & Resources
DGEPNE -- Directorate General of Electricity, Power & New Energy
MOSTE -- Ministry of Science and Technology
ISTIC -- Institute of Scientific and Technological Information of China
PNOC-ERDC -- Phil. National Oil Company-Energy Research & Development Center

- provide information analysis and repackaging services;
- conduct training programs, seminars and workshops in all aspects of information handling and marketing of services; and,
- acquire the necessary equipment for the organization, processing and dissemination of NRSE information.[5]

INNERTAP is still in its development stage, but it has already received recognition and support from other international organizations like the International Development Research Centre of Canada (IDRC) and the Volunteers for Technical Assistance (VITA). This is a manifestation that INNERTAP is on the right track in so far as its projects and activities are concerned.

ASTINFO has continuously endeavoured to strengthen its association with other networks in the region. For example, together with the Regional Information Network in South and Central Asia(RINSCA), it held a joint seminar on "Bibliographic Data Base from the Network Point of VIew." It included members of INNERTAP as participants in a seminar on the "Training of Trainers in Information Use" held in Jakarta, Indonesia from 23-27 September 1985.

There are institutional networks and experts in specialized subject fields existing in the region. Unesco has issued invitations to them to become Associate Networks of ASTINFO. These networks are:

1. Commonwealth Regional Renewable Energy Resources
   Information System (CRRERIS)
   c/o CSIRO
   Australia
2. Devinsa Development Information Newtwork South
   Asia at Marga Institute
   Sri Lanka

3. Health Science Literature Library and Information Science Network (HELLIS)
   The National Medical Library
   India

4. Regional Network for Agricultural Machinery
   University of the Philippines at Los Banos
   Philippines

5. Regional Network for Microbiology in South East Asia Department of Biology, The Chinese University of Hong Kong
   Hong Kong

6. Regional Network for the Chemistry of Natural Products in S.E. Asia, Department of Chemistry, Faculty of Science, Chulalongkorn University
   Thailand

7. Regional Network in Geosciences
   Department of Geological Sciences,
   Faculty of Sciences, Chiang Mai University
   Thailand

8. Southeast Asian Medical Information Center
   International Medical Foundation of Japan
   Japan

National and regional networks, such as those mentioned earlier, are essential in the development of ASTINFO as a strong network system for hastening the flow and exchange of information and experience on science and technology in the Asia-Pacific region. These networks perform crucially important activities to ensure general access to and use of scientific and technological knowledge acquired locally or from foreign sources. Consequently, by enhancing national and regional linkages in STI, ASTINFO helps strengthen science and technology programmes in areas of high priority for development, and it is hoped that it will continue to do so.

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IFLA GENERAL CONFERENCE, TOKYO

PRE-SESSION SEMINAR TOKYO 1986

Special Libraries and their role in National Development

1986

129-PRESESSION-5-E

General Modern Technology and Its Promise for Special Libraries

by

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Data Communication
Network
Special Libraries

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GENERAL MODERN TECHNOLOGY IN PERSPECTIVE:

I would like to draw the attention on the picture of the general modern technology in our society especially on the computer which affect to the progress of library works.

Computer Age

The First Generation, 1951-1958, of the computer age may be dated back to June 14, 1951 when the first UNIVAC (Universal Automatic Computer) was delivered to the U.S. Bureau of the Cencus for use in tabulating the previous year's cencus. It was also the first time that a computer had been built for data processing applications. Vacuum tubes (electronic tubes were used as the internal computer components).

The Second Generation, 1959-1964, was the era of the transistor revolution. Three Bell Lab scientists J. Bardeen, H.W. Brattain, and W. Shockley developed a small type of electronic circuitry called transistor and were used as the internal components of computer to replace the vacuum tubes. This generation also marked the development of machine languages to assembly languages (symbolic languages) and the development of the higher level languages-FORTRAN (FORmular TRANslator) and COBOL (COmmon Business-Oreinted languages).

The Third Generation, 1965-1970. The integrated circuit had been used to replace the transistor in computer. An integrated circuit is a complete electronic circuit on a small chip of silicon. One chip of silicon was able to replace an entire circuit board of transistor. Software became more sophisticated during this third Generation. Minicomputers began to supplement the large third-general computers. The machines, somehow, can function equivalent to a full-sized system but are smaller, slower and less expensive.

The Fourth Generation, 1971-present, was an extension of the third generation technology. Specialized ships were developed for computer memory and logic. One of the results of the advancement in solid-state technology is the capability of fabricating very large numbers of transistors (1,000 or over) within a single silicon chip. This is known as large-scale integration. A direct consequence of large-scale integration is the microprocessor. So, a set of system devices, including the microprocessor, memory, and input/output elements, interconnected for the purpose of performing some well-defined function, is known as a microcomputer or microprocessor system.

This generation is also the era of the explosive use of microprocessor because it can anticipate in virtually every machine in the home or business. Computer environment have been changed. There is no need for climate-controlled rooms, some recent models (especially microcomputers), can be placed anywhere. Large computer did not disappear because of small computer entered the market. Mainframes manufactures have continued to develop more powerful computer, e.g. the Supercomputers from Cray.

The Fifth Generation is the Japan's challenge. In 1980, Japanese government in cooperation with major computer manufacturers and research groups havedeveloped a major project to create the next generation of computer technology. Aimed at 1990's, they are determined to create new machines with speech recognition, massive memories, knowledge base processing and enough intelligence to adapt to the foibles of human input. The fifth generation of computers would be information processors that would be able to deal with vast bodies of information, manage it using expert system models, inferences and associations, and learn from experience.

The Fifth Generation computer project was conceived as an international cooperation effort. All nations are invited to join and set up their own parallel projects or offer assistance.

The Size of the Computer:

Users have different needs in computers. The National Statistical Office, aerospace corporations, Airlines need the large computer. Some users handle personal finances of private offices need only the smallest system, a microcomputer. The college libraries, state and city offices require the intermediate-sized minicomputers.

Mainframes and Supercomputers

Mainframes are the largest and most expensive computers. They are considered general-purpose computers used by large institutions to provide comprehensive computer services. Mainframes have huge memories and often process around 5 million instructions per second. The main uses of the mainframe are for processing big amount of data quickly. The mightiest of the mainframe are supercomputers.

Minicomputers

In design and concept, a minicomputer is like a mainframe, but it is a medium size, speed and lesser expense. The minicomputer swept into the market in late 1960's and originally was intended to be small and serve special purpose. In a fairly short time they became much more powerful general-purpose machines. The term supermini is now commonly applied to minicomputers at the high end of the size and the price scale. Input and output system of the typical minicomputers are through terminals. Other peripherals are printers and disk storage devices, including floppy disk drives.

The uses of minicomputers range from railroad car scheduling to hospital management or medium size research library management. Besides, small business computing, minis are used for word processing and for data communications including distributed data processing.

Microcomputers

Microcomputers have several names which are personal computers, home computers, desk top computers and cost from $100 to $10,000. Microcomputers have microprocessor (a central processing unit manufactured on a silicon chip which is smaller than our thumbnail) in them. In addition to microprocessor, there are two kinds for main storage-RAM and ROM.

RAM (Random-Access Memory) is the computer's scratch pad which helps the intermediate results of calculations. ROM (Read Only Memory) contains system programs that are not changeable through the keyboard. Microprocessor-controlled devices such as microwave ovens also have RAM and ROM-ROM for the stored instructions that can not be changed and RAM for the very simple calculations.

Microcomputer can be used in various business and education: Personal finances, records, schedules, correspondence, plans, entertainment, games, information network, inventory, bibliography list of library materials (special bibliography) and work processing.

DATA COMMUNICATION:

We send and receive our information through mail, telephone, T.V. and radio, books and periodicals. They have not changed in a generation.

Data communication system, computer systems that transmit data over communication lines e.g. telephone lines or coaxial cables, have heen gradually evolutioning through the past two decades.

In the early days large general-purpose computers were built to operate the centralized data processing. Eventually, total centralization proved inconvenient. All input data had to be transported physically to the computer and all processed materials picked up and delivered to the users. It is clear that the next logical step should connect users via telephone lines and terminals to the central computer.

Thus in the 1960 s, the introduction of time-sharing through teleprocessing systems, that is the connection of terminals to the central computer via communication lines, made the centralized system more flexible.

In the 1970 s, the using of minicomputers by various institutes or business firms for processing their own data were clearly decentralized system. They also access to the central computer. This new development was called distributed data processing (DDP). It is similar to teleprocessing, except it has not only remote access but also remote processing. Processing and files are dispersed among various remote locations and can be handled by smaller computers (mini or microcomputers) or hooked up to the central host computer.

Teleprocessing

Teleprocessing system steps are as followed: The terminal produces digital signals. Then the mode will convert a digital signal to an analog signal or vice versa. The process of converting digital to analog is called modulation and the converting of analog to digital is called demodulation. The communication channel can be used either telephone lines, which is the most convenient communication lines, or coaxial cables which can transmit data at a much higher rate. The microwave transmission and satellite transmission are another channels of communication system. Microwave transmission will transmit the data signal trough the atmosphere. The relay stations are positioned at various points to continue the transmission. The satellite transmission, the satellite will act as a relay station and can transmit data signals from one station to another.

The usage of fiber optics, tubes of glass half the diameter of a human hair, connected in cables to make a light path will help in transmitting of data. Fiber optics can transmit data faster than other technology.

The second modem is needed at the end of the communication line to demodulate the analog signal to a digital signal again. Then, the digital signal will go through a communication processor called a front end processor, a computer, in arder to relieve the central computer of some of communication tasks and free for processing application program.

Distributed Data Processing

In addition to the centralized computer, each local has its own computer. The local site will process their own data but the generalized processing will be done at the central site. Some DDP systems do not use the central host computer, the local computers are linked to each other. The DDP system has both advantages and disadvantages. Reduced load on host computer, quicker response time, easier access, tailored application, improved management reporting and lower operating cost are the benefits of DDP system. There are some drawbacks which are; less on-site expertise, software and memory limitations, problems of maintaining consistency in programs, incompatability in equipment and complexity.

Networking:

Because of the advance of the new technology, computer networking has become a major way of communicating of information.

Electronic fund transfer. By using computer technology, people can pay for goods and services through the transfering fund from various checking or saving accounts electronically. Automated teller machine (ATM) is the best example of electronic fund transfer system.

Teleconferencing or computerized conferencing will allow people in difference geographical locations to hold conferences while sending messages back and forth to each other through a network of computer terminals.

Telecommunication shopping will allow consumers to shop at home by selecting goods from video display catalog. The retailer, after receiving the order in computer, will assemble the goods from a fully automated warehouse. Fund will be transfer from the customer account to the retailer account. The customer can pick up the goods or have them delivered at door. The similar system allows for the electronic newspapers.

Electronic mail messages intended for various users can be sent and stored for later retrieval. Voice mail is a computer-based system in which one person can speak into a standard telephone. The message is recorded in digital form and can be forwarded.

THE PROMISE OF THE NEW TECHNOLOGY

Similar to other types of library, the special libraries also had explored the usage of new technology for library works. One of the earliest is the experiment of punched card indexing at the library of the Atomic Energy Research Establishment, Harwell in 1950. The experiment was abandoned after two years for reasons of the limitation of equipment for large and sophisticated retrieval system.

In 1965, From the main parameters relating to twenty five mechanized installation summarized in Jahoda and Accola's 'Library records prepared with the aid of data processing equipment' indicated that some of them operational, some experimental. The principal functions mechanized were:

1) control of periodicals
2) producing lists and catalogues of books and reports
3) lending books and reports
4) ordering and accessioning books
5) lending periodicals
6) circulation of periodicals

The twenty five installations covered a range of libraries including university, public, government and industrial. The suggestion given to the special library was that the development of the total system. The potential advantages of the system was that one record, created at the acquisition stage, can be manipulated to provide acquisition, loan, index. cataloging and retrieval. An example of the this system is the work done at the Atomic Weapons Research Establishment (AWRE) at Aldermaston.

With the invention of the microcomputer in the fourth generation, 1971-present, there is a great interest in the use of microcomputers in libraries and information service. As J. Howard Petrie has mentioned in the article's 'Microcomputers in Australian libraries and information services,' an formal request for information on microcomputer uses in Australia was carried out. Letters were sent to academic and special libraries in 1984. Replies were received from 165 institutes: 112 stated that they were not using microcomputers and 53 stated that they were. Some libraries have microcomputers as back-up devices for system on large computers. A number of libraries are using commercial data base management packages for a variety of purposes. Word processing is the most popular.

The project on the applications of the networking of special libraries has been carried on. An example is the project LANs of a British Library Research and Development Department (BLRDD). The project started in 1983. The purpose of the project is to be a data transmission system linking various computers (minicomputers, mainframes and microcomputers) and peripheral devices within a building or site. The system based on Apple microcomputers is not easily by those unfamiliar with computers. The system allows on-line searching, data base management, electronic diaries of events, electronic mail, viewdata and external communications.

The use of computer technology of the special libraries in Southeast Asia (SEA) region has been surveyed during May-June 1986. Nineteen letters were sent mainly to special libraries in Indonesia, Malaysia, Philippines and Singapore. Eighty-seven letters were sent to the special libraries through out Thailand. From 19 questionaires, 11 replies were received. Four libraries stated that they do not apply the new technology for library work yet. One library stated that by the end of this year they will apply computer processing. The rest three libraries do not have the specific date yet.

Seven libraries indicate that they are using computer for their library operations. Some commercial software packages (such as MINISIS, URICA, CDS/ISIS, WLN, DBASE III, STAIRS and SPL) have been used for perform variety of functions. Four libraries stated that they are using mainframe computer, 2 libraries stated that they are using minicomputer. Only 2 libraries are using the small computer, microcomputer.

In the survey of the usage of the computer technology of the special libraries in Thailand, replies were received only 34 libraries; 30 stated that they are not using the new technology yet, but they plan to use within one-five years, 4 stated that they are using for performing index, bibliography, handbooks, acquition, cataloging and information retrieval system. The software packages used are MINI/MICRO CDS/ISIS, Word Star, DBASE III, CDS/ISIS. Two libraries have Mainframes and microcomputer, and the other two libraries use micro-computers.

SOFTWARE:

There are now a number of software packages for mainframes, minicomputers and microcomputers. These software packages have been developed for almost every library routines and applications. These include information retrieval, online searching, catalogues, acquisitions, serials control and circulation control.

The development of the software packages has been carried both by commercial companies and by users or some international organizations. Unesco also plays an important role in development of library packages and distributes free of charge for libraries. CDS/ISIS, Mini-Micro CDS/ISIS, IV+V and SUPERDOC software packages were developed for library application to run on the mainframe and on the microcomputer respectively. Other softwares such as URICA,HOMER,EAGLE,STRIX,InMagic,BOOKCAT etc.

The Future:

The evolution of hardware technology is continuing to grow at a phenomenal rate. For instance, the Z-80 microprocessor chip contains 8,500 transistors in a module of 193 mils by 180 mils. In 1990 s, some engineers expect that with the large scale integration that densities of ten million components per chip will be commonplace and this advance will allows the special libraries to use the microcomputers more efficient and meaningful.

Storage technology. The direction of the storage technology is miniaturization. Magnetic storage will hold more data. A4-inch Winchester hard disk will hold millions of bytes of information. Optical storage devices can record pictures, graphs and copies of actual documents. This device will be very popular because of the ability of storage a number of data.

The future of the special library in using of the modern technology is very optimistic and promise. The trend of using microcomputers are widely discussed.

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Institutes	Project/work	Start date	Hardware	Software	System	Record Format	Database size	Production
Clearinghouse & Documentation Services Division, Science Promotion Institute (Philippine)	System for Science and Technology (NISST)	1980 -	Hewlett-Packard HP 3,000 Series 40	MINISIS	On-line & Batch	MARC	18,197 records (Printed pub.) 1, 914 records (Analytic)	
Forest Research Institute Malaysia	Library computerization	July, 1985 -	2 IBM PC Compatible Each has 3 disk drive 20 MB hard disk	DBASE III NINI/MICRO CDS/ISIS	On-line	NON-MARC	6,000 records	Bibliographies Reading lists
Monetary Authority of Singapore National Library SILAS Advisary Committee	1. Singapore Integrated Library Automation Service (SILAS)	1) 1984-	1) IBM	1) WLN	On-line	1) MARC		1) National database project
	2. MAS Library Serials Index	2) 1985-	2) IBM 4361	2) STAIRS		2) NON-MARC		2) Index periodical articles
NGEE Ann Polytechnic (Singapore)	URICA Turnkey Library System		1 MBCPU Memory 260 MB Harddisk 30 Terminals 1 Tape drive 1 Line Printer 6 IBM ATS 6 Barcode readers 1 Color Printer 1 Laser jet Printer 6 Thinkjet Printer 1 Backup character Printer	URICA	On-line	MARC	50,000 records	Comfiche Catalog; Spine labels; card catalog

(2)

Institutes	Project/work	Start date	Hardware	Software	System	Record format	Database size	Production
Petronas Carigali Sdn. Bhd. (Malaysia)	DBASE for exploration data	Jan. 1986 -	IBM PC/AT	DBASE III	Batch	NON-MARC	14,550 records	-
Science University of Malaysia;Nat. Lib;of Malaysia Agri Univ; of Malaysia; Univ. of Malaya; Nat. Univ. of Malaysia; Northern Univ. of Malaysia and Nanyang Technological Institute in Singapore	MALMARC SYSTEM	1977 -	IBM 4381 Model Lol 4 tape drive, 1 line printer, 14 terminals, 250 MB disk storage	Library Software Package	Batch	MARC	29,860 records (as of 30 April 1986)	Library cat. (COM) Shelflist (COM) Accession lists Authority files Union catalog (COM)
Faculty of Veterinary Science Chulalongkorn University (Thailand)	-	1971 -	IBM Main Frame IBM Microcomputer	MINI/MICRO CDS/ISIS	batch	NON-MARC -		Veterinary Indes Comulative Index Serial Holding Buffaloes, a bibliography
office of His Majesty's Principal Private Secretary (Thailand)	Computerized Information on His Majesty's project, Temples; Lists of names and personnels	April, 1986	NEC Microcomputer ASTRA 350 NEC APC III (Personal computer)	Developed by Datamat Co.	batch	NON-MARC		
Thai Airways International Limited		Jan., 1986	IBM PC/XT 10 MB Hard disk Kiskette FACIT Printer	Word star DMASE III	batch	NON-MARC	500 records	Technical manual International jandbook Reports

Institutes	Project/work	Start date	Hardware	Softward	System	Record format	Database size	Production
Southeast Asian Regional Center for Graduate Study and Research in Agriculture (Philippines)	Agricultural Information Bank for Asia	1974 -	HP3,000, Series 40 HP2621A Terminal 10 User Terminal 2 Disk Drives 1 Tape drive 1 Line printer 1 Word processing Terminal 1 Daisywheel Printer	Operating System -HP MPE v.; Image/Query; MINISIS; SPL; COBOL II.	on-line & Batch	NON-MARC	AGRIASIA 60584 records CARIS 7,000 records INNERTAP 2,000 records Personnel 300 records	
Asian Institute of Technology (Thailand)	BOOKCAT	1975 -	IBM 3083 16 MB; Disk; Line printer Tape drive Terminals Display writer	CDS/ISIS	on-line	MARC	65,000 records	Order slips, New titles list, Financial statement, catalog card
	Online Information Retrieval Service	1982	- IBM PC1 (3) IBM PC/XT (2)					
	- AAGE			CDS/ISIS	on-line	MARC	31000 records	Reports; bulletin
	- ENSC						3,600 "	
	- IFIC						1,500 "	
	- RERI						2,500 "	
	- UNIO						7.800 "	

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Special Libraries and their role in National Development

130-PRESESSION-6-E

PROBLEMS OF COLLECTION DEVELOPMENT IN SCIENCE AND TECHNOLOGY LIBRARIES

BY

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Since time immemorial human thoughts, imaginations, views, experiences and ideas were recorded on clay, metal, wood, papyrus, leather, parchment, vellum and various other things. The place where these writings were organized and stored was called "Library". Study has shown that since then scientific and technical material was segregated. The excavation of the Library of King Ashurbanipal (668 - 628 BC) revealed about 20,000 cuneiform tablets, more than one third of them devoted to science.[1]

From the 15th Century the Renaissance flowered in Italy and gradually travelled to western countries. Glory came to Europe in the form of advancement and civilization . Great artists put life into stones and canvas, filling the art gallaries and museums with paintings and sculptures. With this, science too forged ahead and came into its own. Renowned scientists like Copernicus, Bruno, Galilio emerged, and with their revolutionary ideas and experiences changed the entire structure of the society.

Much later than the invention of paper printing came into eminence. This amazingly increased the number of scientific and technical communications. Printing and publication of scientific literature gave birth to science and technology libraries. By the 18th Century, however, the scientific and technological journals began to treat every specific topic in science.[2] Present century has witnessed the culmination of scientific and technological development to the space and nuclear age resulting astoundingly in the rapid multiplication of knowledge and information which is termed as literature explosion.

SCIENCE AND TECHNOLOGY LIBRARIES - ROLE AND OBJECTIVES

Information is a resource for the social, economic, industrial and educational development of a country. The scientific and technical libraries maintain liaison between the available stored knowledge and information.[3] Thus libraries put emphasis on providing particular information contained in books and pamphlets. Their chief characteristics is to retrieve and file information and disseminate it without any delay They particularly deal with current information which is available in periodicals, technical and research reports, pamphlets, reprints, off-prints, neo-prints, pre-prints, standards, specifications, patents, etc. The ultimate goal of science and technology librarieis is an efficient, effective and maximum transmission of relevant and needed information to information seekers. Their objectives then clearly are to acquire bibliographical material related to the interests of a particulare user population, actual or potential, to organize and display these material in various ways and to make them available to users. In wider context, libraries are part of the entire process of transferring information via the published record.[4] Thus it is clear that science and technology libraries should take dynamic role in achieving the following objectives:

To maximize accessibility of materials to users.
To maximize exposure of users to materials.[5]

SCIENCE AND TECHNOLOGY LIBRARIES IN PAKISTAN

Pakistan came into being after the partition of British India on 14th August 1947. The two wings called East and West Pakistan were separated by the distance of more than sixteen hundred kilometers. The region comprised Pakistan remained comparatively neglected in the field of scientific activity during the British regime as all the centres of research and publications in the sub-continent happened to be located in the areas now forming the Indian Republic.[6]

Pakistan received a very meagre inheritance in terms of scientific and technological institutions and manpower.[7] Only two libraries of sizeable collection namely Punjab and Dacca University Libraries came into Pakistan's share. Lahore, once 'cradle of library movements' in the pre-partition India still abounds in libraries, but its library glamour was tarnished when Pakistan came into being. Its library resources were looted and damaged in the riots that befell the city as a result of partition.[8] Everything was to build from scratch. The Government of Pakistan set up a number of important scientific organizations viz Food and Agriculture Council, re-named as Pakistan Agricultural Research Council (PARC). The Pakistan Council of Scientific and Industrial Research (PCSIR), The Pakistan Atomic Energy Commission (PAEC), and the Pakistan Reserch Council (PRC) in the fifteis. Later as a consequence of the recommendations of the Scientific Commission, appointed in 1959,
number of
a numbwe od major new scientific organizations were established.[9] About scientific and technical libraries the Scientific Commission appointed in 1959 has to say "We have noticed a woeful lack of up-to-date

scientific books and technical journals in the librarieis of scientific establishments. The importance of fostering the exchange of ideas and establishment contacts with scientific workers in other countries cannot be overemphasized ... but the most important way to achieve this in through books, journals and other scientific literature."[10]

SCIENCE AND TECHNOLOGY LIBRARIES - PLANNING

In the year 1956 an expert from Australia, Mr. L.C. Key was invited by the Government under the auspices of Colombo Plan to survey the library conditions and to chalk out a comprehensive programme of the services in the country. Mr. Key submitted his report in 1956. It included the needs for strengthening scientific libraries with particular emphasis on those attached to the chain of Laboratories of PCSIR.[11] In 1957 Pakistan National Scientific Documentation Centre (PANSDOC) was established with the technical and financial assistance of UNESCO. The main function of the centre was to provide science and industry with access to the world's published scientific and technical literature through the documents procurement, translation and bibliography compliation services.[12]

Noticing the lamentable conditions of the libraries in scientific departments, universities, etc. PANSDOC organised a symposium on the "Development of Scientific Libraries in Pakistan" in March 1963. The symposium offered avenues to the scientists, educationists, librarians, and publishers for presenting their problems, complaints and appreciations based on their experiences.[13] After three days of reading of technical papers, discussions and deliberations a few recommendations were made.

- Establishment of one Central Science Library in both the wings of country.
- The task of the compilation of the national union catalogue of scientific and technical periodicals was given to PANSDOC.
- National Science Council (NSC) was asked to approach the Government for simplifying the procedures for important and clearance of scientific and technical literature.
- Formulation of the integrated inter library loan policies was realized.
- Enhancement in the status and grades of librarians working in the scientific librarieis was recommended.
- PANSDOC was asked to conduct a survey of the existing scientific and technical library resources.

As a result, the following facts came into limelight:

- There is a great dearth of scientific and technical resources in Pakistan.
- Pakistan is lacking miserably in having a qualified and experienced manpower who could ably acquire, organize and disseminate the said resources.
- Much more difficulties have to be surmounted to procure the scientific and technical linterature.
- There is a lack of bibliographic control and its accessibility.

The veteran librarian of John Crerar Library, Chicago, Dr. Herman H. Henkle visited Pakistan in 1966 with the help of UNESCO, to survey the existing conditions and analysis of the need of science and technology libraries in the country.[14] Dr. Henkle proposed the establishment of two such libraries in Dacca and Islamabad.[15] The PCSIR Library at Karachi was to serve as a regional library centre. These libraries were to be autonomous agencies of the government. An agency called the National Science Libraries and Information Centres was to head the libraries and PANSDOC under an Advisory Board of the National Science Libraries and Information Centres. The proposed libraries and Information Centres have also been included in the Fourth Five Year Plan (1971 - 1975).[16]

In 1971, following the catastrophe of political upheaval, the region called East Pakistan separated and became an independent state "Bangladesh". Now Pakistan is comprised of four provinces of Baluchistan, North West Frontier Province (NWFP), Punjab and Sind, spread over an area of 491,798 square kilometer inhibited by 84,253,644 people. Besides,Federal Capital territory (Islamabad) has an area of 560 square kilometer.[17] In 1974 an expanded project namely Pakistan Scientific and Technical Information Centre (PASTIC) was built around the Nucleus of PANSDOC and was transferred from PCSIR to Pakistan Science Foundation (PSF). The PASTIC is located at Islamabad whereas its sub-centres are functioning at Karachi, Lahore, Peshawar and Quetta. The PASTIC is currently offering wide ranging facilities such as supply of scientific documents, current awareness services, publications of abstracting and indexing journals, information transfer service, patent information, environmental and NTIS and NTIS information and referral services, bibliographic and translation services, data processing on computers, production of union catalogues and directories, indexing of theses and dissertations.[18]

Ministry of Science and Technology, in its report analysed various factors which deter the over progress in research and development. To obviate these deterents they set some priorities. One of the aims and objects of these priorities is to develop an effective information network for sicnece, engineering and technology, having adequate links with international information services, for providing research and development workers and their interested agencies speedy access to current knowledge in different scientific and technical fields.[19]

FACTORS AFFECTING SCIENCE AND TECHNOLOGY

Government of Pakistan is giving a special emphasis in producing manpower to face the challenges coming up due to the rapid progress of science and technology. New subjects like computer sciences and engineering, bio-technology, energy, mechanization of agriculture, etc., is being introduced in the national universities. This effort is bound to produce positive results and it is expected that scientific and technical manpower presently numbering five thousand is going to be raised between eight to ten thousand in the coming ten years.

With the result of Government's direct involvement in the higher training of personnel programme approximately four hundred young scientists will be sent on higher training to the advanced countries every year.

NEW TRENDS

The science and technology libraries are fully conscious of their role to fulfil their obligations in the ever increasing needs of the clientele by providing quick and up-to-date services. Photocopying machines continue to be used extensively. Tele-typewriters, electric data processing, computer terminal, etc. will continue to flourish in the libraries.[20] The establishment of computer data base in Pakistan will assist in maintaining the information infra-structure to deal effectively with the transfer of scientific and technological information from more developed areas of the world.[21] These measures would help in the overall social and economic development of the country. Efforts are underway to establish the data base in Pakistan by PASTIC with the help of Quaid-e-Azam University.[22]

AVAILABLE LIBRARY RESOURCES

A diagnostic survey made by the M.A. students library science in 1974 under the supervision of the Chairman of the Department of Library and Information Science, University of Karachi, Dr. Anis Khurshid, provided "systematic assessment of library resources of practical research value based on valuable information and data collected from all kinds of 555 libraries." The survey revealed the book holdings of all type of libraries comes to as much as 5,934,937 which still fall short of 240,229 books to match with the 1974-75 collection of one single university in the United States, the Yale University (collection 6,175,166).[23] A directory published by the National Science Council mentions 143 science establishments with libraries contain about 1,278,635 books including about 90,000 patents.[24] Anis Khurshid, however, mentions in the said survey that the total number of scientific and technical books as901,557 and general reference books as 168,342 which are the 31.4% and 6.2% respectively of the entire total allocation of books in Pakistani libraries.[25] The Union Catalogue of Scientific and Technical Periodicals published by PANSDOC in 1970 shows that 80 libraries of Pakistan hold 5000 periodicals.[26] This includes nine libraries of East Pakistan which are now in Bangladesh.

COLLECTION DEVELOPMENT : PRESENT PRACTICE

Judicious and planned efforts to build the collection of science and technology is imperative. The objectives should be pre-determined and clearly defined. Valerie George has laid down the following principles for effective selection of library material.

- Satisfaction of immediate requirements.
- Establishment of comprehensive basic collection.
- Provision for future interest, in so far as they are discernable.[27]

In the case of literature explosion no individual library, despite its immense financial resources would ever hope to satisfy the overall requirements of its clientele. Library of a big industrial organization, a research oriented or a library of a small concern has its own financial limitations. Therefore, "Comprehensive" has almost given way to "selectivity", for the financial support to these libraries could not keep pace with inflation in information source prices, increase in library personnel costs, and rising library operation and maintenance cost.[28]

BOOKS AND THEIR ACQUISITION

Books take nearly one year in preparation and by the time they are published information contained in them is often outdated. In comparison, periodicals research reports, conference papers, proceedings, etc. give upto date and current information which is vital for scientific and technological research and development. Yet, the books form the chief content of technical university and college libraries and they get a fair representation in the specialized scientific and technical collection as well.[29] Reference books, research publications, proceedings etc. for a basic collection of any scientific and technical libraries. To advance researches, the necessity of such books in developing countries can not be ignored. Selection of booka in **such** libraries is difficult task for every books which a selector intends to include in the collection has to be merited by author's reputation and standard of the publisher. As a guide to what is in print, lists of titles from any available source such as known publishes catalogues, bibliographies and compilations from certain helpful book dealers can be assembled and studied.[30] A few standard and reputed international book selection tool which play essential role in selection are,as under:

British National Bibliography, Cummulative Book index, Whitaker's Cummulative Book list, Books in Print (U.S.A), British Books in Print, Book Review Digest, British Book News, Winchell's Guide to Reference Books, Jenkin's Science Reference Sources, Bibliographic Index, etc.

In Pakistan, unfortunately, during the span of 35 years, book publishing and trade did not progress appreciably, the production of science and technology books is lamentably low. In 1977, out of total 1133 books published in Pakistan, scientific books numbered only 100 which is about 8.78 % of total book production. According to a cautious estimate, so far, only 4000 books have been published in Pakistan since its inception. Due to ineffective bibliographic control, it is a mammoth task to get to know about the scientific book production. One has to depend on occassionally appeared lists produced by booksellers, publishers, etc. Sometimes reviews, announcements appeared in newspapers, periodicals assist in selecting the reading material. At the time of independence there was no copyright deposit system. In 1963 the Press and Publications Ordinance was enforced which was later repealed by the West Pakistan Press and Publication Ordinance. According to the provision of this ordinance printers are required to supply four copies gratis of each book and newspapers to the respective provincial Information Departments. The Provincial Governments were obliged to compile and maintain a register called catalogue of books and periodicals.[31] These catalogues soon ceased to be published.

In 1962 the Pakistan copyright ordinance was enforced but could not be enforced till 1st March 1968 and three depository libraries at Karachi, Dacca and Islamabad designated as recepient.[32] This made the compilation of bibliography comparatively easier. A retrospective Pakistan National Bibliography covering the period from 1947 to 1961 was compiled by Pakistan Bibliographical Working Group (PBWG) with the help of UNESCO. Then it was published for the years 1962, 1963-64, 1969, 1972 to 1980. 1981 volume is being printed.[33] Thus the National Bibliography post 1981 is still in arrears.

The other reliable source for getting information about the national publications is a monthly Library of Congress Accession List "South Asia" which gives fairly a comprehensive coverage to the current publications of Afghanistan, Bangladesh, Bhutan, India, Maldiv, Pakistan, Sri Lanka. The other worth mentioning publication in this field is the "Library Accession List by UNESCO, published in Bangkok and gives coverage to Pakistani publications.

PERIODICALS

Published by the learned societies, academic institutions, government bodies, independent research institutes,professional bodies, commercial publishers, are known variably as journals, serials, magazines, transactions, proceedings, bulletins etc., appearing weekly, monthly, quarterly, their value cannot be overestimated. They form the heart of most specialist collection and in many scientific and technology library more is spent on them than the books. D.W. King's survey for the National Science Foundation found that almost two thirds of U.S. scientific and technical communications resource expenditure(including manpwoer cost) was accounted for by

....

periodicals compared to little over a quarter attributable to books.[34] The contents of most books in science and technology is based on the periodical literature of previous years.

During the past few years we have seen tremendous acceleration in the growth of periodicals. It was

1900 -- 1960 -- 59,000 periodicals
1961 -- 1970 -- 75,000 periodicals
1971 -- 1977 -- 94,000 periodicals (35)

The number has presently exceeded to 100,000 periodicals. The selection tools for the periodicals normally are:

Ulrich's International Periodicals Directory.

British Medical Periodicals (Brithsh Council 5th ed. 1977).

Directory of Indian Scientific Periodicals
(New Delhi, Insdoc, 1968. 2nd ed.)

Commonwealth specialist Periodicals.
(Commonwalth Secretariate, 1977. 2nd ed.)

UNESCO list of Scientific and Technical Periodicals in
34 countries of Africa (Paris 1972).

PASTIC's Directory of Scientific Periodicals, 1986 reveals the names of 200 periodicals published throughout Pakistan. The holding list of scientific periodicals in Pakistani libraries published by PANSDOC in 1967 shows about 5000 title of journals available in Pakistan libraries. keeping in view the tremendous production one could well imagine the accessibility of Pakistan scientists to the carriers of current literature.

SPECIAL MATERIALS

Research reports, patents, standards, specifications, research findings, dissertations and pamphlets are the publications of research, information and are essential to every working scientist for the certain singnificant results of researches and are the means to keep abreast of current achievements in the field of science and technology. Some of the information not covered by normal processes are available through these medias. These materials could be located through daily, weekly, monthly lists of Government publications published by Her Majesty's Stationery Office, D.S.I.R. monthly summary of reports, U.S. monthly catalogue of Government Publications, Aslib Index to these, BSI News, ASTM, etc.

These resources, in Pakistan, are meagre. The research reports, surveys, and findings are published by the relevant organizations but poorly publicised. PASTIC's publications "PASTIC Patent Lists',"List of PASTIC Bibliographies," "Index to Theses and Dissertations" etc., is an effort in this context. Pakistan Standard Institute also takes out their publication off and on.

Audio-visual resources are not a very popular media for research and studies in Pakistan so far. But a few libraries have visualized their importance and efforts are being done to bring more scientific literature through these medias as well.

PROBLEMS

NON-EXISTANCE OF SELECTION POLICY

The main function of the science and technology library is to provide information to the user which is appropriate for research requirements. The principles of appropriateness implies that selection shall be deliberate and discerning, that it shall planned in accordance with well defined policies and procedures.[36] Contrary to these principles there are unfortunately, no set systematic, and cohesive book selection policy. Usually the librarians have a little say and almost everytime they have to obey the instructions of sentior scientific staff, Heads of the Divisions, Directors etc. The job of librarian is to place and execute the book orders. The Senior Staff Members, normally make haphazard, random and hasty selection out of the available book lists, reviews, etc. Being non-professional people, they are generally unaware of the relevant selection tools and even if they are being helped by the librarians, they, because of their preoccupation and busy schedules find it uninteresting and tiring to go much into the breadth and depth of the material they wish to recommend. This normally leads to a biased selection resulting in clusters of material on some topics, while the others are bitterly ignored.

The disorganized selection and biased attitude of authorities bring the librarian closer to the end of financial year, and afraid that after a few weeks allocated funds may not be lapsed, the team of experts together with librarian visit different book shops to level the budget, and purchase whatever comes on their way. This attitude certainly leads towards building an unbalanced collection.

Periodical lists, once prepared are never reviewed. Hackneyed practice of inviting proforma invoices and making payments as per routine are carried unimaginatively. If slash in the number of periodicals, due to fund shortage, becomes necessary again the professional bias comes to fore and a few useful periodicals are sacrificed for personal reasons.

NON AVAILABILITY OF BIBLIOGRAPHICAL RESOURCES

Mention has earlier been made about the serious dearth of bibliographical resources for procuring regional and national literature. The Pakistan National Bibliography which could be the sole tool to encompass the country's printed literature did not appear since 1981, which clearly means that Scientific literature post 1981 is still in oblivion.

Due to lack of resources it is also hard to get current foreign bibliographies and book lists and even after efforts they are procured, the time lag put many publications out of print or obsolete.

RISING COSTS AND INCREASING INFLATION

The rising costs and increase in inflation during 1980's hit the book trade and libraries of developing nations very hard. The galloping prices of books and journals and lamentable devaluation of Pakistani Rupee in terms of Sterling and Dollar have adverse effects on the libraries. The rates of Pak. Rupee are floating against foreign currencies and in comparison to books the prices of journals are soaring very high. We take an example of the annual subscription of "Biological Abstacts", which was $ 1800 or Rs. 25,200 in 1985. This year the price has gone upto $ 3600, which means direct 100% rise in the price. But, due to Pak. Rupee the price has gone upto Rs.59040, amounting to enhance in priced by 143% in Pak currency. These factors are seriously impeding the progress of our libraries.

DEARTH OF OF MANPOWER

There is an alarming shortage of science-oriented personnel working in the science and technology libraries. In fact the subject background of librarians working in such libraries is an added advantage which generally helps the acquisition, organization and dissemination programmes of the libraries. In many science and technology libraries important positions were occupied by the arts graduates not because of shortage of science graduates but for the low prestige and status of librarians in society.[37] Young science graduates do not find the librarian's job lucrative and prefer to serve other commercial and industrial organizations.

ABSENCE OF CO-OPERATION

Co-operation amongst librarian is essential for developing collection. Most of the co-operative plans which exist and operate like Formington Plan, may be too complicated for Pakistan.[38] But, some sort of co-operation in the acquisition of library material between libraries is the need of the time. To start with the libraries situated in close proximity may divide the areas of interests and help each other by inter-library loans. PCSIR library is not more than 3 kilometers away from University of Karachi. These two libraries subscribe "Chemical Abstracts" Biological Abstracts" and many other journals and reference books separately. If they formulate a plan to divide the subjects and titles

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and cater each others requirement much funds could be saved and diverted to gain some other useful material and duplication may be avoided. Time has really reached to think over the introduction of some functional resource sharing and co-operating acquisition programmes for better collection building.

FINANCIAL ASPECTS

Proper building is an excellent instrument of planning and financial control. The budget is a definite "financial, plan, as a forecast of the means for carrying the plan into effect, as a current guide, as a cost summary of the operations and as a historical record and basis for the formulation of future policy, it is an indispensable instrument in the hands"[38] of librarians to run the libraries. There is not proper budgeting policy from the parent organizations towards the libraries. The budgets allocations from the organization for acquisition programme is haphazard and unimaginative. (Even if where there is the same policy, adhrerence to it is uncommon. Usually budget allocations towards the purchase of books do not commensurate to the total budget of the parent organization. A meagre percentage is given to the libraries. Hence due to rising cost most of the important literature could not be brought in.) Many big organizations do not believe in budgeting the libraries separately, they purchase books and periodicals out of the allocations, meant for the purchase of instruments or from miscellaneous expenditures. One can well imagine how can a good collection be built under these unfavourable circumstances.

LOSSES IN TRANSIT

Like other developing countries we also suffer due to irregularities of postal and mail system. Many important publications and specially the periodicals do not reach in time and usually go astray. The foreign publishers normally allow three months for claiming the missing issue. The waiting and reminding always take time and librarian has to hear "Sorry since the claim is not in time it could not be entertained." Missing gaps are very usual which under the facts mentioned above is impossible to fill for back issues cost much more than the current ones.

FOREIGN EXCHANGE, CUSTOMS FORMALITIES

It is encouraging to note that realizing the importance of books and periodicals government has lifted the foreign exchange restrictions on importing the reading material. But getting import licence and fulfilling other formalities entail many problems. After ordering when the packages reach the ports, there start the unending problems of customs rules and regulation, Censorship, Octroi duties, etc., which consume much time and energy of the importing organization.

CONCLUSION

The scientists and research workers are baffled for want of pertinent material in connection with their research and intellectual pursuits. The avoidance of overlapping and duplication of research has become imperative. The impediments in building a comprehensive and balanced collections are raising their heads in the forms of paucity of funds, lack of bibliographical control, absence of standards, poor book production within the country, shortage of technical manpower, etc. These factors have joined together to erode the very existence of Science and Technology libraries. Time has arrived to do now something substantial or never. The concerted efforts to remove all the barriers to acquiring scientific and technical literature in building up the collections should be made immediately. The science and technical libraries by virtue of information could revolutionze the entire structure of the society and the librarian may contribute his expertize to major social and economic changes.

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Special Libraries and their role in National Development

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PRESESSION-8-E

Evaluation of Special Libraries and Information Centres in Asia

by

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EVALUATION OF SPECIAL LIBRARIES AND INFORMATION CENTRES IN ASIA

Abstract

Some constraints in the development of special libraries in Asia like lack of finance, inadequate foreign exchange, increasing cost of periodicals etc. are discussed in detail. Offline and online searching of databases as available in some Asian countries are outlined. Library automation activities using minicomputers in a few Asian countries are described. Networks available in South East Asia are described. Some suggestions by way of library legislation to include some provisions in the national information policy, national information system, library associations are given. Regional training facilities available in Asia to man special libraries are then narrated.

Introduction

The special library is a typical institution of the Industrial Age. Its function is to support its organisation's programs and goals. Special Libraries are information centres intended to serve a specific clientele; they are expected to furnish in-depth extensive searches to use outside commercially-available data banks, when necessary and compile bibliographies and abstracts. Special library users need information in whatever form the information is produced - hard copy, microform, diskette or video disc.

Planned library development in Asia has really been a post-war, post-independence effort. The state of special librarianship differs among several Asian countries. The special libraries in Asia work against great odds; they struggle with scarce funding apart from lack of trained staff, inadequate official support and recognition; they have publishing and book trade problems. They have so many local languages like Hindi, Chinese, Japanese, Korean, Pilipino and Vietnamese and their literacy is also at lesser level. They also struggle with too many demand on the available resources.

Access to publications

The budget allotment for libraries in Research & Development

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establishments in Asia is less than one percent whereas it ranges between four to five percent in developed countries. Hereagain, within Asian countries, budget allotment for special libraries is considerably high in Japan, Hong Kong, South Korea etc. as compared to India, Laos, Kampuchea, Burma, Sudan etc. This low priority in budget allotment results in less procurement of required publications for research and development activities in these Asian countries. No doubt, these special libraries are able to supply the documents to the researchers to some extent. But, it is not of the same order as is available in developed countries. Over 90 % of the capacity for generating, communicating and utilizing information especially in science and technology rests with a small number of technologically and industrially advanced countries (some 30 countries with over $800 per capita income and sharing 35 % of the world population burden). The developing countries (about 120 countries with less than $500 per capita income and sharing over 60 % of the world population burden) have to purchase this information in the form of books, periodicals, reports, patents, standards etc. from the developed countries at an enormous cost involving foreign exchange. It is difficult for Asian countries to meet this increasing need since most of the time they are at the receiving or borrowing end; they find themselves no nearer to richer nations they tried to follow.

Information is power. At the threshold of Information era, when the concept of "INFORMATION POOR" (Developing countries) and "INFORMATION RICH" (Developed countries) is gaining wide recognition, time has come to find out ways and means to share this vital information for the benefit of mankind globally.

Due to lack of foreign exchange in most Asian countries, special libraries are not able to purchase an adequate selection of international science and technology journals because of more pressing commitments. Even if these journals were purchased, the liklihood is, that it will be the largest special libraries which receive them after an extended time-lag without any network facility within that country or region for sharing thevaluable resource with the less fortunate within the Asian region.

The language restriction to English could be a limiting factor in many Asian countries, or again, restrict them to the highly educated scientists to the widespread international influence of Anglo/U.S. thinking. This will also result in the non-subscription of local vernacular journals (due to dearth of funds), which vary widely in quality but dealing with that nation in a language which is easily understood by the local population.

Moreover, the citation analysis for the evaluation of scientific output of aggregated units such as laboratories, journals and nations in Asia shows that Asian journals are cited rarely in the world literature of science as seen from Science Citation Index.
In the case of India which is a Superpower in Third World Science, the large percentage of references quoted in Indian journals are to Indian journals and to literature published 10 years ago or older.
In contrast, international journals reporting mainstream science quote a much larger percentage of recent literature. This is an indication of Asian researcher's preoccupation with problems which are perhaps no longer considered relevant in scientifically advanced countries.

Searching of International databases

Offline searching

MEDLARS search is made available through South East Asian Medical Information Centre (SEAMIC) in Tokyo under the auspices of International Medical Foundation of Japan (IMFJ) as well as World Health Organisation in the medical libraries of University of Malaya, National University of Malaysia and the Science University of Malaysia.

In Singapore, compilation of bibliographies is done in the University of Singapore using MEDLARS services provided by SEAMIC,Tokyo and the Austrian National Library, Canberra.

In India, Indian National Scientific Documentation Centre, New Delhi, by using IBM 370 Mainframe computer located at the Indian Institute of Technology, Madras, provides a batch-processed SDI service covering about 0.5 % of India's research scientists through access to Chemical Abstracts Condensates. Similarly, Indian Institute of Science, Bangalore offers offline SDI service with INSPEC and BIOSIS.

Online searching

Online searching of databases in Scince and Technology like COMPENDEX, MEDLINE, INIS etc. is possible in a few countries in Asia whereas instant access can be had by just dialing a telephone number in U.S.A and Canada. DIALOG II offers now in U.S.A. six full-text databases like Drug Information Full Text, Harvard Business Review etc. It now offers more than 50,000 password holders access to more than 200 databases containing 100 million records online and available in over 80 countries. The citations are culled from more than 60,000 journals. Currently, an estimated 2500 databases are available.

In Hong Kong, the Cable and Wireless (CHK) Ltd. provides International Database Access Service to its subscribers to access large database computer systems in USA and Canada via TYMNET and TELENET Networks. The Hong Kong Productivity Centre was the first institution to offer its Online Information Service. With recognition of the advantages of online Information Retrieval but with less certainty about effective service charges and budgetary arrangements, the University of Hong Kong Library introduced On Line Information Service (OLIS) to the University Community in January, 1980. The result of the survey in Hong Kong confirmed that there is a genuine demand for OLIS not only in science and technology but also in humanities, medicine and social sciences. 97.3 % are in favour of continuation of OLIS.

Japan Information Center of Science and Technology (JICST) created by Japanese legislation has developed on line services through JICST Online Information System (JOIS) based on Chemical Abstracts Search, MEDLINE, TOXLINE, System Development Corporation's ORBIT and Lockheed's DIALOG. JICST follows closely the pattern of Russian Scientific and Technical Information Service - VINIT and also the pattern of INSDOC in Delhi.

In India, following successful demonstration at National Aeronautics Laboratory (NAL), Bangalore of access to databases at the European Space Research Centre at Frascati, Italy in March, 1981, a project is in progress to set up two high-speed terminals known as MIKROTEL package with the active support of such scientific user organisations in Bangalore, Defence Research and Development Organisation, Council of Scientific and Industrial Research and UNESCO experimentally for 6 months envisaging the establishment of a dedicated 2400 bps Post and Telegraph Microwave link from Bangalore to Bombay and of an Overseas Communication Service and ITALCABLE satellite link through INTELSAT from Bombay to Frascati near Rome with a grant of US$ 35000 from UNESCO to cover the costs of the hardware and training needs under the ASTINFO Project assistance programme to become operational in 1986. Apart from this online service, Defence Scientific Information Documentation Centre (DESIDOC), New Delhi has now a hook up with DIALOG costing about US $ 70/- per query.

Networks

Networking has now become a major concern in Asian Countries. A Network is a co-operative effort among the libraries for resource-sharing and having access to literature of other libraries, within the country, within the region and then to the libraries and literature of inter-regional or international libraries.

WHO/SEARO HELLIS Network

HELLIS is the acronym for Health Literature, Library and Information Services Network covering the eleven countries of WHO South-east Asia Region : Bangladesh, Bhutan, Burma, DPR Korea, India, Indonesia, Maldives, Nepal, Sri Lanka and Thailand. HELLIS has been able to carry out the following activities:-

1."Index Medicus for WHO South-East Asia Region" has been compiled.
2.Retrospective bibliographies like an 'Annotated Bibliography of medical literature in Burma 1866-1980'compiled by Mrs. Khin That Htar are being published.
3. The HELLIS newsletter has been issued to disseminate relevant information of HELLIS activities.
4. Free MEDLINE searches and photocopies are being provided.

The HELLIS Network tries to serve not only the relatively small number of research workers in the medical schools but also to meet the information needs of the vast number of health professionals posted in any corner of the country. Steps are being taken by the WHO Regional Office, New Delhi to identify and improve the capabilities of libraries in the network.

Congress of South East Asian Librarians (CONSAL) has supported two important co-operative programs. National Libraries and Documentation Centres - South East Asia (NLDC - SEA) is a consortium of the national libraries of Malaysia, the Philippines, Singapore and Thailand and the National Documentation Centre of Indonesia. It was established with the approval of their governments and with the objectives of establishing an inter-library exchange network for the libraries in South East Asia.

The other Network is International Serials Data System - South East Asia (ISDS -SEA). This aims at creating a regional node for the ISDS in the National Library of Thailand. The objective of the scheme was to create regional union list of serials, both local and foreign and to create a regional database of national serial titles. This Centre was funded entirely by the Thai Government with some financial assistance from International Development Research Centre, Ottawa, Canada and UNESCO.

Library and Regional Documentation Centre of Asian Institute of Technology (LRDC/AIT), Bangkok consists of four specialised information centres, viz.,

1. Asian Information Centre for Geotechnical Engineering (AGE),
2. Renewable Energy Resources Information Centre (RERIC),
3. International Ferrocement Information Centre (IFIC) and
4. Environmental Sanitation Information Centre (ENSIC).

They try to cater to the information needs of researchers in the Asian region in the above disciplines.

MINi Integrated Set of Information System (MINISIS) software developed by International Development Research Centre (IDRC), Ottawa for library automation activities and information retrieval activities for use with Hewlett Packard 3000 series Minicomputer is used by Rubber Research Institute of Malaysia Library especially for the creation and maintenance of 6 databases like 'Natural Rubber' (having at present 12000 entries rising upto 30,000 in the next 3 years), 'Rubber Manufacturers', 'Project Monitoring' etc.

Library automation activities

The above MINISIS software given free of cost to any organisation in a developing country by IDRC is used for library automation in 17 institutions in Malaysia and Singapore. National Council of Applied Economic Research, New Delhi also uses this package.

National Library of Singapore is automating its catalogue by using British Library Automated Information Service (BLAISE). Plans for an Information Centre for the South Pacific to be called the Pacific Information Centre are under discussion with the major objective to "be primarily concerned with the collecting, recording and disseminating published and unpublished materials originating in the region and / or relating thereto". At the same time, specific parts of the work of the Centre, such as the register of research projects hand union list of periodicals will be developed in anticipation of using the computer very shortly, with the possibility of searches in external databases.

National Information policy

The national government should set up an anency at the national level to define the information goals of the nation. This agency should strive for the establishment of modern national information transfer networks linking special libraries using advanced processing and communication networks. National Information policy is absent in many developing countries. In India, a 14-member committee on National Policy on Library and Information System has submitted its report to the Government of India very recently after a national survey.

National Information System

As per FID/DC's stipulations, the main elements of a National Information System could be :

1. A governmental agency for general planning and co-ordination of the documentation and library system.
2. A network of specialised documentation centres.
3. The national library.
4. A network of specialised libraries to cover information needs in specific fields of science and technology.
5. Specialised documentation centres concerned with patents, standards etc.

If the national government incorporates the above provisions in the national library legislation, there is a possibility that special libraries can prosper better.

To quote one instance, Madras Public Libraries Act,1948 (as formulated by Prof.S.R.Ranganathan as the first library act in India) has a provision to levy library cess @ 5 % of Indian currency paid as House tax in Tamilnadu state in India to manage the public library system in that state. The excess money generated by this Act amounting to the equivalent of about one million US dollars is now being utilised for the construction of a separate scince and technology library in Madras with provision of hostel facilities for the researchers during their consultation period in the above library. This method of self-financing may be tried in other Asian countries.

The first stage in setting up a system of documentation, information and library services will be the establishment of national documentation and information centres. National Documentation Centres like Indian National Scientific Documentation Centre, New Delhi (INSDOC), Pakistan National Scientific and Technical Documentation Centre (PANSDOC), Iran Documentation Centre (IRANDOC) etc. guide, co-ordinate and supervise the documentation and information activities. There are still few countries in Asia which do not have such national information system.

National libraries should produce national bibliographies, preferably in database version using its own MARC format. Abstracts of scientific literature produced in each country should be produced by the national documentation centre in the MARC format. The information about the holdings of scientific serials in the special libraries spread over the country shall be prepared and shall be made available in MARC database so as to facilitate the researcher to know about its possible location within the country. Such union catalogues of periodicals are printed and distributed by the national documentation centres. Indian National Scientific and Documentation Centre and Indian National Social Sciences Documentation Centre, New Delhi are doing a commendable job in this regard. After locating the document in one particular special library, it shall be able to supply the document to the researcher anywhere in the country without routing it through the national documentation centre. A xerox copier may be supplied to each special library to achieve this end.

Absence of strong library associations

Voluntary efforts to form library associations proved to be less effective in Asian countries. The existence of Special Libraries Associations only in a few Asian countries like Japan, India, Philippines, Indonesia etc. proves that there is still room for the development of such associations in other Asian countries. A strong library association will be able to influence the national government in setting up a national information system. It is suggested that there may be a provision in the national library legislation for mandatory membership of library professionals in a local library association to be affiliated to state-level association, which, in turn, to be affiliated to national library associations which will be represented in the International Federation of Library Associations.

Inadequate professional manpower and training

Book culture is of a recent development in many of the developing countries. Love of reading has not become part of the national ethos. Literacy level of the local population is also at a low ebb. Library profession is yet to achieve recognition and respectability in these countries. Hence, the attraction to the library profession is not strong enough. Moreover, library science departments to train the information professionals are of recent origin. The Information science curriculum varies widely in the library schools within the country and within the region. Payment of low salaries to library staff as compared to the higher salaries paid to academic staff contributes to the lack of adequate dedicated professional staff to man the special libraries which need special skill and exposure to modern developments in Information Technology.

In India, INSDOC, New Delhi conducts special courses in Associateship in Documentation and Reprography (ADR) to man the special libraries. Similarly, Documentation Research and Training Institute, Bangalore conducts special courses in Associateship in Documentation and Information Science (ADISc) and Small Industries Service Institute, Hyderabad also conducts Information Science courses in which Asians and Africans participate.

Under UNESCO-UNDP Project, the Institute of Library Science, University of the Philippines, Diliman, Quezon city, Philippines conducted the Post-Graduate Training course for Science Information Specialists in

Sout East Asia in 1981 and distributed the Integrated Set of Information (ISIS) software to the participating librarians in the Asian region for possible application in their respective countries.

Asian Institute of Technology, Bangkok conducted Training courses on Specialised Information Centres in July, 1984. It also conducted courses on Library and Information Services for librarians from developing countries in May-July, 1986.

It is suggested that Association of Special Libraries and Information Bureaus (ASLIB), London, College of Special Librarianship,Aberystwyth, South Wales, Special Libraries Association, New York, Canada Institute for Scientific and Technical Information, Ottawa, Canada, Japanese Information Center of Science and Technology, Tokyo etc. may conduct courses in special librarianship and Information Technology in a few centres in Asia to may the special libraries in this region with possible supply of necessary hardware and software by UNESCO/IDRC for possible application.

Impediments

The impediments in the healthy growth of special libraries in Asia are first and foremost the lack of resources of money and manpower. Weaknesses in communication and transport, poor telephone and postal services, inadequate roads and rail services, lack of continuous electricity supply impeding the installation of reliable computers, government restrictions on the foreign exchange on the import of machinery and spare parts, dependence on expensive imported experts, barriers based on time, language and distance are some other factors. Due to the vastness of area, due to lack of urgent information requirements of the population, due to the economic backwardness to pay so heavily to get that information and due low priority in library budget, Information supply is poor in Asia. The money spent for special libraries in Japan (2020 special libraries), South Korea, Singapore, Malaysia, Hong Kong, Soudi Arabia, Kuwait etc. is more than some other Asian countries. The directories of Special Libraries published in India, Indonesia, Japan, Philippines etc. help us in evaluating their collections, statutory organisation, budget, subjects and publications. The library literature of Asia is too varied from the professional coverage in Singapore, Japan, India etc. which is extensive, reliable and uptodate to that of many other countries with little or no library literature. Lack of special library standards, heavy workloads, low educational qualifications, lethargy on the part of the scientists in educational institutions, lack of encouragement with inefficient inter-library loans in many countries in Asia etc. hinder the effectiveness of special libraries in Asia.

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Special Libraries and their role in National Development

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PRESESSION-9-E

Modern and Innovative Concepts in the Organization and Management of Special Libraries and Information Centers

by

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It is an honor to be included in this excellent program with the many knowledgeable speakers we have heard and will hear in the coming days.

I am David Bender and I am the Executive Director of the Special Libraries Association. I want to discuss "Modern and Innovative Concepts in the Organization and Management of Special Libraries and Information Centers." Before I begin I want to give a brief overview of my Association, or SLA. SLA was founded in 1909 by John Cotton Dana. Dana had a particular interest in special libraries and created the first business library in the United States at the Newark Public Library. The goal of the Association is to advance the leadership role of the special librarian. Today, 77 years since its founding, the Association has more than 12,000 members in the United States, Canada and Europe. SLA's membership, like each of you, is concerned with the quality of the service they provide and the overall management of their library.

The information explosion has created the demand for special librarians ... people who are expert in increasingly narrower segments of subject knowledge, with solid background in library and information science. All major corporations, institutions, and scientific and technological enterprises are dependent on the storage, retrieval, and use of information. With the melding of new technologies, the combination of computer science and retrieval technologies, the profession is growing and moving ahead. There is no stopping the need for information, for the world of work cannot proceed without knowledge. To handle the vast amounts of knowledge today, we must perfect our abilities to manage, store, manipulate, and retrieve information. These are the foundation of our profession. The information business and putting knowledge to work are essential to the growth and progress of our various nations and the world.

As a result of the changes in our world, in the move from an industrial to an information society and in the growth of technologies impacting on the special librarian profession, we have one new and exciting challenge: to more effectively and efficiently manage our special libraries or corporate information centers.

As a profession, we must concentrate on what needs to be done. We must establish our priorities, for if we fail to establish goals, someone else will and the profession will be set back. We must strive to be:

Managers of people
Managers of money
Managers of materials
Managers of machines

Managers of marketing

Managers of programs

Librarians may lose the power to mold future library practices. Unless we plan and dream about the future, we will see the future slipping through our fingers and the advances that the profession has made in the past decade will be lost. At all times we must guard and develop the image of special librarianship, an image that shows the value of information and the value of the profession of special librarians within our "Information Society."

I believe that it should be one of our primary goals to insure that the management of special libraries is of the highest caliber and that the management team is recognized by the people who use and fund them: top management.

In speaking on management, I want to consider two interrelated areas: traditional management of a special library and the future of special libraries. In making this distinction, we will develop the foundation for sound management practice and then see how those principles hold as the workplace changes.

As we begin our discussion on management, please keep in mind an axiom that is heard in many information centers: "Good information management requires good management information."

In other words, no library, either one-person or a state-of-the-art automated library, can be successful unless we, as the librarians, can obtain the information necessary to monitor functions today and plan for tomorrow.

I do not support the idea that one management program, organizational structure or methodology is better than another. We are in an age of countless management philosophies. Through our personal experiences and those of our colleagues, we must all agree that what is good is what works!

As special librarians and as managers or administrators, we must examine our personal management style. We must evaluate our management capabilities in light of the most current theories and then we must go that extra step and go beyond the practice and theory to create a management culture that meets the special needs of our special libraries. An expert administrator will develop a style that will not be found in management theory textbooks or heard from Harvard MBA graduates.

Special librarians have a responsibility to establish excellent information management programs. Each of us share a responsibility to develop menagement programs that work in our unique settings. And, finally, we must strive to recognize change within our libraries, parent organizations and profession and support one another in selecting the alternatives in managing change. Our goal as administrators is to excel and succeed despite future obstacles we may not perceive or understand.

In general, there are six areas of responsibility critical to the management of special libraries. They are:

1. Planning
2. Budgeting
3. Organization and Personnel
4. Supervision
5. Marketing
6. Evaluation

As I hope is implied, these areas are given from the point of view of a library manager or administrator. As many of us know from personal experience, being a manager is a formidable task.

I will cover briefly each of these six areas to develop a common ground for discussion and will point out trends and innovations.

Planning

A textbook definition of planning is, "the process of getting an organization--in our case a special library--from where it is to where it wants to be in a given period of time by setting the library on a predetermined and agreed upon course of action."

An administrator must be able to decide what the accomplishments or goals of the library should be in both the short- and long terms. It is the responsibility of the manager to develop a plan that ultimately reaches those goals. Planning requires insight into the parent organization and the ability to project into the future. A knowledgeable manager knows the limitations of staff and sets high goals within the grasp of staff.

Within the planning area, two trends have become evident in recent years. Consultative Management and Management by Objectives. In both cases, good managers tap staff and top management for input into the goals and objectives of the library.

Consultative Management uses input from employees to aid the manager in making decisions and plans. In consultative management it must be clear that the manager is ultimately responsible for decisions.

Management by Objectives consists of setting goals or objectives by a section manager, the supervisor and with the involvement of all staff members.

Both forms of management build morale of staff because staff believe their opinions and input are given attention.

Many special libraries have also become involved in "strategic" planning in which the length of time is a factor for accomplishing a task. Two examples of strategic planning in a library include planning a new facility or automating various aspects of the library. In both cases, months, if not years of work, are required from the initiation of the project to the conclusion of the work.

Budgeting

Budgets can be defined as estimates of revenues and expenditures for a year. The year is frequently known as the fiscal year because in many cases the year does not coincide with the calendar year. Budgets may be developed for a period longer than a year; however, this practice is rare.

In many organizations, budgets are viewed as programs and the final approval of the budget is understood as the approval of the program or course of action.

There are four basic types of budgets and each vary in complexity.

The Line Item Budget is a line-by-line listing of items for which funds have been appropriated. This form of budgeting is commonly used and simple to understand. Each and every item within the budget has a dollar amount with no indication as to how the funds will be used.

A simpler form of budget is the Lump Sum Budget which has a total sum of funding for the library. This is not a commonly used budget and is difficult to explain to top management. In this budget, tremendous pressure is placed on the manager to use the funding effectively.

Formula Budgets can be effective in budgeting special collections. The formula will take the guess work out of the budget process. For example, in a university library, the formula can be based on the number of graduate students, faculty size, number of doctoral degrees, the number of departments and so on. For each element a sum is allocated. The drawback in this type of budgeting is determining the formula.

Program Budgets are complicated yet extremely useful to the library manager. This budget relates the use of funds to specific programs and can be used to inform top management of the services provided in relation to their costs.

In recent years a trend has been developing toward Cost Centers. In the library context, the overall costs of the special library would be divided among departments receiving services from the special library. A variation on the Cost Center is the Recovery Center. In a Recovery Center, outside customers are serviced by the library at a fee, generally on an hourly basis. In other words, the special library recovers as much of its operation expenses as possible. The remaining costs are charged to the sponsoring organization.

A major responsibility of the library administrator is developing a budget and operating within its parameters. To stay within budget during any fiscal year, five general guidelines must be observed:

1. Prepare an accurate budget.

2. Communicate to staff any special problems or limitations of the budget.

3. Monitor expenditures on a regular basis.

4. Understand how the library budget fits into the overall organizational budget.

5. Decide which areas of the budget can be cut that have the smallest impact on the operation of the library.

Organization and Personnel

Developing an internal organization and staffing a library can be the most critical issues facing a library administrator. No matter how effective a library manager is, at some point the staff takes over. A well-organized and well-staffed special library is more apt to be successful than a loosely organized, under-staffed library.

Perhaps the least effective way to organize a staff is to have each and every staff member report to the administrator. The administrator's time would be wasted in this reporting pattern. Valuable staff leadership would go underutilized, if not completely ignored.

Despite how a staff is organized, there are a number of principles that, if observed, can strengthen the library staff and attribute to a well managed library.

1. Lines of authority must be clear. Employees should have only one supervisor.

2. There should be an adequate number of supervisors. In large libraries, no one supervisor should have an excessive number of people to manage. The administrator must have a manageable number of supervisors.

3. Employees should know management personnel. Clear distinctions should be made between management and support staff.

4. All staff must have access to an organizational chart.

Organizational charts must be kept current.

5. Organizational structures must be flexible.

6. Consider the structure of the organization in developing the library structure.

There are no "golden rules" for developing an organizational plan. Effective organizations take into account the number, type and quality of staff. Libraries should continually evaluate their structure and modify the structure as the library changes.

In developing a structure, do not underestimate the performance of staff. Remember, a structure that appears to work on paper may be ineffective in a given situation.

Staffing a library is another area in which standards are not readily available to determine the type and number of employees in a particular situation. The problem that arises in special libraries is that of subject specialization. In a special library with a large focus, the key to success for the administrator is an effective interview process during which specialists with the highest degree of skills can be ascertained.

There are two additional musts for the effective manager in a special library: job descriptions and a procedures manual.

Job descriptions play in important role once the organizational structure is developed. Descriptions inform employees what is expected and indicate the relationship of one position to the overall organization. In addition to indicating the duties of a position, a well written job description will specify educational requirements, previous experience and salary range.

The last component that completes and solidifies the organizational structure of a special library is the procedures manual. The manual will include a detailed listing of duties to be carried out by each position along with enough descriptive material to perform any given job with little, if any, supervision. Manuals for support staff are more detailed than manuals for professional staff members.

In discussing Organization and Personnel, one cannot avoid the one-person library. For many, the one-person library is an ideal situation; however, despite the size, nearly all of the problems and responsibilities of a large scale library are evident: planning must still be done; a budget will also be prepared; marketing and evaluating the services of the library will be crucial to operations. Additionally, all other library functions must continue: collection development, reference and cataloging.

The freedom that comes with one-person librarianship also has drawbacks including reduced promotional opportunities, potential for clerical duties overwhelming other work, lack of professional advice from colleagues on the job, and the possibility of inhibiting one's professional growth.

Supervision

Library administrators must provide leadership for their employees as a major part of their management duties. Effective management is now more appropriately defined as effective leadership and is described as the ability to move a staff towards its goals.

Leadership involves many functions. To list a few I would include:

1. The ability to use the staff and their individual and combined resources. The supervisor must know the abilities, talents and limitations of staff.

2. Motivating employees to achieve individual and organizational goals.

3. Assigning work and special assignments.

4. Implementing staff development to enhance skills and talents.

5. Managing for change and anticipating change. Change will have a distinct impact on working environments, goals, equipment, technology and use of facilities.

Problems of supervision faced by the library administrator are staff motivation and conflict management. Motivating employees continues to be one of the more elusive areas of supervision in any profession since every employee is an individual with interests, needs, motivations and goals. Effective management programs, whether Consultative Management or Management by Objectives, can be vital in determining and achieving high levels of employee motivation and morale.

Conflicts among staff may not always be solved, particularly in cases where basic philosophical differences are the root of the conflict. In general, however, conflict management solves traditional conflicts through a simple two-step process: 1) identifying the conflict, and 2) agreeing at a resolution. Conflict frequently results from poor communications, personality clashes, or policies and procedures.

Over the past ten years one theory has evolved that accounts for the best thinking in the area of supervision. Organizational Development, or OD, goes beyond managing clerical and professional staff. An effective Organizational Development program for a library manager will allow that administrator to enhance relation-ships among staff, formulate staff development programs to meet the changing needs of staff, increase staff participation in managing, evaluating and offering services and setting goals for the special library.

One way to define Organizational Development is that it is planned, organization-wide, and managed by top management with a goal of increasing the organization's effectiveness and health through planned interventions in the organization's processes.

Marketing and Public Relations

Numerous studies have shown that marketing--or promotion--of the special library's services within its parent organization will have a direct and positive impact on the library. Good public relations for the special library begin with an enthusiastic and helpful employees and include an environment suited for intellectual persuit, books and journals in their proper place, working equipment and convenient hours.

There is a wide assortment of tools to market the library: orientation speeches for new employees, audio/visual or videotape presentations on the information center and its services, printed brochures, newsletters, regular updates of materials and new services, tours, guest lectures, exhibits and formal library courses.

Internal public relations and communications with the parent organization's top management and staff are other outlets for marketing the services of the special library. Employee newsletters can also be used in the overall marketing of the library.

Achievements of the library staff--whether they publish in professional journals or are elected or appointed to positions within professional organizations--should be publicized. Local newspapers are a valuable source of public relations for special libraries.

Marketing and public relations efforts remind top management that the special library has a value to the staff and ultimately the organization. In turn, an enhanced image of the corporate library will enhance the image of the library administrators.

A trend in marketing the special library is "segmentation" in which library administrators develop programs to address the specific needs of a target customer.

Evaluation

An excellent management practice is to periodically evaluate and assess progress made toward reaching the library's goals. Evaluations provide valuable information to the library administrator whether or not they are required by the top management of the parent organization. It is better for the manager to discover weaknesses or areas of improvement before conditions deteriorate to the point where complaints are made and top management demands a report. Even if no serious problems are found in the special library, a manager can always find ways to improve the functioning of the library.

Questionnaires and interviews are two methods commonly used in an evaluation process.

Printed questionnaires vary greatly in complexity and length. General guidelines for printed questionnaires include: 1) short in length, 2) clearly written, 3) confidential, and 4) simple to complete.

Interviews can be conducted one-on-one or in a group. In either case a standardized set of questions are prepared and given in the same manner to all interviewees.

There are positive and negative aspects associated with both forms of evaluation; however, if circumstances permit, both methods can be used since each obtain different types of information.

Content and timing of the evaluation depend upon local circumstances.

Holidays and vacation periods are poor choices for evaluation periods. An evaluation conducted during the budget process of an organization is ill advised as is one held prior to or immediately following a reorganization.

Subject matter, style and wording are three important aspects of content. The administrator must be careful in selecting the focus of the questions as this determines the usefulness of the data.

Other variables must be considered in the evaluation process including length of the evaluation period, number of respondents and breakdowns of respondents.

These six areas: PLANNING; BUDGETING; ORGANIZATION AND PERSONNEL; SUPERVISION; MARKETING; and EVALUATION are the responsibilities that are critical for the effective management of a special library. These constants are found in any setting and are not dependent upon the type of special library, the number employed, technology, or lack thereof, or goals of the parent organization. Put another way, these are basic management responsibilities not limited to the special library.

With those six areas established as the basis for management of the special library, what does the future hold for our profession?

Edward Cornish of the World Future Society told SLA members in 1981 that, "... new developments in information technology will open new opportunities for special librarians. Electronic technology will become common by 1990."

Cornish also tells us that, "Libraries of the future will probably yield to the growing popularity of computer discs to store information. Videodiscs will also become a standard in future libraries. Videodiscs will not displace the book ... but libraries will be under increasing pressure to keep them as well as books."

Cornish concludes, "The bottomline is that the world's libraries in the future will be increasingly digitized and globalized. Information from libraries will move instantaneously from one library to another and from libraries to businesses, government offices and homes everywhere. Libraries that scorn information that is not in book form will play a declining role in the future, but libraries that embrace the newer technologies without neglecting books ... should become increasingly valuable to their patrons."

The promise of technological advances and exchange of information are but two progressive movements of this decade and the future. Today we are on the threshold of the "Global Library" where computers are able to read the card catalogs of libraries around the world.

Just to give you an idea of the advances of the past year, in July 1985, members of the OCLC Online Computer Library Center, a computerized library network providing shared applications and hardware services, were able to read the card catalog of the British

Library. Grolier, a large educational publisher, put its 21 volume, 9-million word Academic American Encyclopedia on a single compact disc with 80 percent of the disc's capacity remaining. A final technological advance that is rapidly gaining in acceptance in special libraries is Compact Disc Read Only Memory, or CD ROM.

Industry Week magazine reported recently in an article entitled, "Where Will Your PC Take You?" that there are now 2,800 databases available in the U.S. That figure has increased from only 400 in 1979 or a jump of nearly 600 percent!

Megatrends author, John Naisbitt, tells us that, "Scientific and technical information news increases by 13 percent per year, which means it doubles every 5.5 years. But soon that rate will jump to perhaps 40 percent per year because of new, more powerful information systems and an increasing population of scientists. That means data will double every 20 months."

Each of us must recognize that the technological changes have propelled the image of librarianship from an occupation to that of a professional career.

Allen Veaner, a library consultant in Toronto, describes the modern generation of librarians as having, "... ceased to be production workers ... whose major responsibilities included the production of a certain number of output units, whether titles selected, items cataloged or revised, or cards filed. Nearly every modern librarian has assumed a galaxy of programmatic duties and responsibilities which only a few decades ago were confined to top administrators or a few expert specialists drawn from outside librarianship."

What, you may ask, has happened to the librarians' "old" jobs? Those old jobs have gone to the support staff whose work covers a wide range of essential duties. The changes within the profession over a relatively short period--one generation--have provided magnificent professional enrichment opportunities for special librarians and have similarly enriched the jobs of support staff.

The challenges of modern technology and the future have given the special librarian a new host of responsibilities. Veaner also provides a litany of qualities of librarians that are applicable to each of us as special librarians. Those qualities include: manager, planner, system designer, leader and supervisor, mediator, contract negotiator, resource allocator, writer, speaker, fundraiser, researcher, subject expert, database searcher, collection builder, budget analyst, proposal writer, statistician, consultant, telecommunications expert and entrepreneur."

Modern information professions must be extraordinarily quick in assimilating and interpreting information, evaluating data, extrapolating trends and reaching conclusions. To succeed, each of us must be quick to learn, flexible and adaptable.

Special librarians hold degrees in library/information science as well as a degree in business, finance, chemistry, management, law or technology.

Probably the greatest challenge in the decade ahead for each of us is to guide the information supply so that it is useful to business, in education and for our society. To face the challenge of the future, we must perfect our skills to manage, store, manipulate and retrieve information. We must be more service oriented than ever before. Our skills in finding information--either manually or by computer--organizing, analyzing and packaging it to fit the needs of the corporate world must be razor sharp.

In our technological age we must understand technology and teach it to the user. We must grow professionally as our work settings become more sophisticated. We must know which database might have the needed information, which firm provides that database, how to access that database, and, finally, how to instruct the user in accessing the database.

Information professionals of tomorrow assure their success by constantly preparing for the next challenge. The mark of a truly professional special librarian is twofold: be aware of changes within the parent organization and be a team player.

With those ideas of changes and challenges within the special libraries field facing each of us, let me share with you a number of future predictions to ponder.

Forecast 1: The library of the future will not be judged by the size of its collection, but by its ability to provide information quickly and accurately.

Forecast 2: Within ten years over half of the services provided to library users will be to individuals who never step foot through the front door. The card catalog will go online enabling users to access bibliographic information without the need for a librarian.

Forecast 3: Fee-based interactive research services will be developed.

Forecast 4: More and more staff services will be bought from contractors. Library routines will be developed into standard systems that will be implemented with software packages.

Forecast 5: Levels of service will be developed that will be independent of technology but will be based on staff time required.

Forecast 6: Book circulation will continue to be an important part of library services.

Forecast 7: Commercial document delivery systems will replace interlibrary loan staff and will deliver materials directly to the user.

Forecast 8: Electronic publishing, including on-demand publishing, will overcome hurdles and gain acceptance within the library.

Forecast 9: Libraries will be moved to the computer center or combined with the computer center for work on information system design.

Forecast 10: The flood of information will result in the establishment of Chief Information Officers in major corporations. This position and allignment of mid-level management positions will recognize the special librarian as a vital team player and information as a powerful, competitive weapon in the corporate world.

Forecast 11: Libraries will flourish.

In the past 35 years since the "Information Society" was recognized, our profession has witnessed major change and growth.

In the 1960s, increased funding and the new technology--the computer--brought vast changes in the functions of special libraries. As funding began to stablize in the 1970s, the goal was to reduce costs and, at the same time, maintain the level of services and material purchases. The introduction of bibliographic networks was seen by many administrators as a means of reducing staff.

Another trend of the 1970s was that library orientation, which had been the responsibility of all reference people, was evolving into a specialist position--"bibliographic instructor." This position involved instruction in much greater depth than had been previously visualized.

Another function which increased in importance was collection development. In order to make better use of funds that were available, there was an effort to better control the selection of materials as a way to control expenses and fund automated systems.

The 1980s have seen even larger financial problems in the corporations, government agencies and the academic institutions that fund special libraries. Today the emphasis is to have greater utilization of the resources that are available.

Now as we begin our passage into the 1990s, our profession, more than ever, is exciting and dynamic.

The future is bright. The stage is set. The cavaet for the future is clear: A thorough knowledge of the profession, technology and applications as well as a knowledge of current management techniques, budgeting, long-range planning and the ability to think, react and respond as a business.

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The Optical Disk Pilot Program at The Library of Congress

by

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contracts to private industry, one for videodisk work and one for optical digital disk work. Both are types of optical disk technology and as I proceed with my presentation, I hope to clarify some of these distinctions. I will be giving to you a tremendous amount of information during this short presentation, but you will have opportunities to ask questions at the end of this segment. The Optical Disk Pilot Program at the Library of Congress aims to evaluate the use of optical disk technology for two balancing concerns: information preservation and information management, to determine if such a system can be put to wider use in the future. Optical disks involve the recording of information at the wavelength of light, using lasers. Why optical storage? For two reasons: (1) because of the high density recording and high storage capacity, optical disks now permit the efficient storage and retrieval of digitized images; (2) because the disks are read by reflected light, no wear or image degradation results from their playback. We are involved in this project because of our balancing concerns for preservation and access.

"Man builds no structure that outlives a book," an often quoted statement by Eugene Ware, circa 1898, which aids and comforts librarians, unfortunately has not proven to be true. Many of you, I am sure, are familiar with the brittle book problem. So with this technology, we seek to exploit several

The Optical Disk Pilot Program
at The Library of Congress

Good morning. As Chief of Science and Technology and Director of the Library of Congress Optical Disk Pilot Program, it is my pleasure to present to you today some information about this very exciting optical disk program under way at the Library of Congress. The Library of Congress, like many libraries around the world, faces very serious problems in the area of preservation and conservation of our library materials. We also, as a very large library in our own right, have many concerns about improving our access to the many, many collections in our library. We have more than 80 million items in the Library of Congress, and we have three very large buildings in Washington, D.C., with specialized reading rooms. The user coming to the Library of Congress with comprehensive research interests will have to visit several different reading rooms and submit requests for materials just as he would do in any library. So we at the Library of Congress need to look to new technology for solving some of these needs and meeting some of these challenges in both preservation and access to library materials.

Today I would like to tell you about one very specific project, our Optical Disk Pilot Program at the Library of Congress. Let me give you a couple of background notes here as we move to visuals where you will see the project displayed before you. The Library of Congress, late in 1982, let two opportunities for overcoming these types of problems. In the area of preservation, we are looking for a stable storage medium. We wish to be able to electronically monitor the recorded quality of the data on the disks. We hope to be able to transfer from one disk to another without the generational loss frequently associated with other forms of storage and, as I mentioned, we seek a medium which will experience no degradation from physical contact while in use. With regard to improved access we of course are interested in random input and access; we provide this already in the Library of Congress, as do many other libraries, in terms of our bibliographic control which is, however, information about information. Now we seek to be able to supply the information itself. We are concerned that the important information which we supply be timely (i.e. as soon after publication as possible), and it is very important that the information always be available. With 80 million items in the Library of Congress, we always face the great risk that something is not there when it is needed. We want to have rapid user access and with high storage density, we should be able to deliver great quantities of information from optical disks

We have divided this Optical Disk Pilot Program into two sub-projects, one having to do with conventionally printed materials which we call the print project, and one having to do with our many special collection materials in the Library of

Congress. We have 57 million of these special collection items, primarily visual and sound collections, and we term this part as the non-print project.

In the optical disk print project, we are using optical digital technology to scan high-use serials and periodicals, government publications, legal materials, manuscripts, printed sheet music and maps. These forms of information, such as journals, maps, and printed sheet music items, are digitally scanned and conveyed in a black and white form which also approximates gray scale, and stored on an optical digital disk designed by the Alcatel Thomson Corporation.

On the non-print side of this project, we are dealing with photographic materials, prints and graphics, motion pictures, and television productions and audio materials digitally recorded on compact audio disk. We have selected these types of materials, such as photographs and motion picures, and graphic materials, in large and small formats and, with the assistance of a high-quality photographic firm, taken 35mm motion picture color photographs of all these materials. This 35mm motion picture film was then transferred to videotape, and from that videodisks were then mastered and stamped out, much like phonograph records are. This process illustrates an important distinction between the analog and digital technologies that we are using. With the videodisk in use for the non-print project, you must prepare your program materials in advance and send them away for mastering in a very ultra-clean room environment, unlike the digital disk used on the print project where the laser recording devices are in our own offices and digital images are scanned and recorded on the optical digital disk here.

As I mentioned, greater recording density is one of our major hopes. This chart shows you some rough approximation of the degrees of miniaturization possible with various technologies. A book page of a size of 54,000mm squared is reduced to 35mm microfilm which occupies 150mm squared and then further reduced down to microfiche, requiring 70mm squared of space and eventually down to digital optical disk. The same information quantity could then be reduced to a dot which would measure 3-to-6mm squared, if all the bits that represent the page were grouped together. However, this chart is only for comparative purposes. In fact, the digital optical disk image is written out on tracks as streams of bits in a way similar to the convention used for recording on magnetic disks. Another way of examining the capacity of these disks is to examine this table. We create 12-inch optical disks and we scan at a rate of 300 lines per inch. That means every inch on the page is scanned 300 times, and the information content is changed into a series of zero and ones, or binary representation. Now, our target in this pilot program is to be able to store between 10-15,000 highly resolved images on one side of an optical digital disk. This figure is expressed as a range because of some very specialized circuitry in the system, which enables the compression of the large runs of white and black space into fewer bits for storage and transmission within the system. Therefore, the exact number of pages possible would be greatly dependent upon information that was on the original page. As I mentioned, we are doing this in black and white and in an approximation to half-tone, using a coding process which is only one bit in depth. It is possible to digitize and store fully half-tone images, but far more bits are required for this coding. So the capacity of a disk would be reduced to 500-1,000 pages on one side of the disk for full gray scale. Likewise, one can digitize color, but there the number of bits required to represent the images is even larger and we would only be able to store 110 pages on one side of a disk. Now these are current limitations that we hope will go away as this technology matures, but even if the storage requirement for color is greatly reduced there may be cases where it would still be justifiable to create disks with only a few high-quality digitized color images.

This is not the first optical disk at the Library of Congress. We have been pioneering in this field from the beginning. In 1979 we let a major contract to take the many millions of cataloging cards that we have accumulated at the Library of Congress since the year 1901, when we began to sell these cards to other libraries. This inventory file of cards has become a major problem. It takes a large number of staff to maintain, and the file itself is always subject to damage. The idea back in 1979 was to digitize these card images and then to store them on optical digital disk, using special scanners, and to discard the original cards and print fresh cards on demand. This early project illustrates our current hopes for computer image enhancement as one of the opportunities which digital technology provides. Existing soiled and tattered cards can be reprinted from a stored digital image with all of the soiling removed through digital image enhancement. Now, the irony of using such high technology for printed cards for people to hand file is not of course lost on the Library of Congress, but I wish to remind you that since we began this card sales program in 1901 there are many libraries around the world that still depend on us. Some of these libraries are so impoverished that they do not have rooms all to themselves or even telephones, much less computers. So for this reason we still need to pursue the use of this technology for demand card printing. However, as a measure of how rapidly optical disk technology is maturing, this early optical disk used for the card system is already obsolete and has been overtaken by the newer technologies.

With regard to preservation, I mentioned to you that this is one of our two concerns of the Library's project. The Library of

Congress has preservation laboratories in its own facilities for other preservation work, and we hope to establish an optical disk testing and measurement facility. With optical disks, there are two important times when we will want to measure the quality of the disk. One time is at the very beginning, with the blank disk, making sure that this is of the highest quality. Then, as I mentioned earlier, we hope to electronically monitor the condition of the disks so that we can sense and measure any degradation before it becomes catastrophic, and then, of course, be able to write new copies of the disk. So for this project, in some cases, we will create two disks. One we will put into service in our juke box system for access purposes, and another one we will put into various kinds of long-term and accelerated life-term preservation testing. At the end of this project, we hope to evaluate and publish our findings regarding this program so that we can be able to judge whether we will benefit from the opportunities of optical disk technology in the future.

In summary, then, I would like to remind you of the various opportunities of this technology that I have presented (preservation, service, random access, space compaction, and image enhancement) which will guide us as the Library moves forward to answer these questions: "How can disks help preserve library materials?" and "How can disks help improve library research?" Now, I would like to close with a few comments about the future.

As I mentioned, this is a pilot program of a finite duration. We hope to finish the pilot by December of 1986. A report will be prepared and will be circulated widely for comment, and then we will take these comments and judge where we should go. However, there is a very important aspect of this that I have not touched on, and that is the question of intellectual property ownership or, in other words, copyright and royalties. This issue is a very important part in the future of the use of this technology in libraries and in publishing concerns around the world. To help us work with this issue, we have brought together an advisory group of distinguished librarians and members of the publishing community. They are hoping to put forward guidelines for us and other libraries to consider for the future.

It's been my real pleasure to present this information to you. Thank you for your time and attention.

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Developing Computerized Library and Information Services in Developing Countries - the Problems and Possibilities.

by

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DEVELOPING COMPUTERIZED LIBRARY AND INFORMATION SERVICES IN DEVELOPING COUNTRIES

- THE PROBLEMS AND POSSIBILITIES.

by Ke Hong PARK
Librarian, KAIST
SEOUL, KOREA

ABSTRACTS :

This article describes the merits of library automation and how to plan for automated systems. The author discusses the problems in computerization in developing countries - such as socio-economic, administrative and technical problems - communication, language barrier, cultural differences, choice of systems, hardware, software, lack of standardization and information infrastructure, etc.

The author suggests how to overcome these problems and presents possibilities of resource sharing, networking, cataloging, information retrieval and international exchange of information through computerized library and information systems and presents a case study of computerization of library and information services in the Republic of Korea.

ABBREVIATIONS :

AACR	Anglo-American Cataloging Rules
AACR II	Anglo-American Cataloging Rules 2nd rev. ed.
AKS	Academy of Korean Studies
BIBLIS	Bibliographic Information System
Biodata	Biodata of Scholars in Korean Studies

CA Search	Chemical Abstracts Search
CIN	Cooperative Information Network
CJK	China/Chinese, Japan/Japanase, Korea/Korean
CNL	Central National Library (Seoul)
COMPENDEX	Computerized Engineering Index
CR & D	Current Topics in Research & Development
DACOM	Data Communication Inc.
DACOMNET	Data Communication Network
DEU	Dong Eui University
D/B	Data Base
EDPS	Electronic Data Processing System
ELIPA	Experienced Library and Information Personnel in Developing Countries in Asia and Oceania.
HIU	Hong Ik University
IFIS	International Food Information Service
INIS	International Nuclear Information System
INSPEC	Information Service in Physics, Electro-Technology and Control
ISMEC	Information Service in Mechanical Engineering
KAERI	Korea Advanced Energy Research Institute
KAIST	Korea Advanced Institute of Science and Technology
KBU	Kyung Buk University
KDI	Korea Development Institute
KEDI	Korea Educational Development Institute
KETRI	Korea Electronics and Telecommunication Research Institute
KIER	Korea Institute of Energy and Resources
KIET	Korea Institute for Economics and Technology
KOSE	Korean Scientists and Engineers in Korea

KRIHS	Korea Research Institute for Human Settlement
KSE	Korean Scientists and Engineers
KSEA	Korean Scientists and Engineers in America
KSEJ	Korean Scientists and Engineers in Japan
KSEU	Korean Scientists and Engineers in Europe
KSRI	Korea Standard Research Institute
KSU	Kyung Sang University
KU	Korea University
LCRI	Lucky Central Research Institute
MARC	Machine Readable Cataloging
NAL	National Assembly Library (Seoul)
NTIS	National Technical Information Service
OECD	Organization for Economic Co-operation and Development
PALIS	Proto-Type Library and Information System
R & DRS	Research and Development Reports System
REACC	RLIN East Asian Character Code.
RLG	Research Library Group, Inc. (U.S.)
RLG-K	Research Library Group in Korea
SDI	Selective Dissemination of Information
SNU	Seoul National University
SRDS	Standards Reference Data Service
S/R	Storage and Retrieval
Tech-Info	Technical Information System
TMD	Taejon Machine Depot.
TOPICS	Technical Report Retrieval System
TRRS	Technical Report Retrieval System
TYRC	Tong Yang Nylon Research Center

WPI	World Patents Information
YNU	Young Nam University

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I. Introduction

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V. Computerization of Library and Information Services in the Republic of Korea

VI. Conclusion

I. Introduction

A Library is a living organization attached to a designated institution to serve its constituents with information they need. That body could be a city, a country, an educational or research institution or a business firm. However, the author's use of library and/or information services in this article is limited to the research (or special) libraries and information centers attached to institutions or operating independently.

Operation of library and information services is partly professional and partly clerical, e.g., selection and classification of information materials such as books, reports and periodicals, or identifying required information requires professional knowledge, while ordering, recording and checking them in only needs para-professional or non-professional staff. Operation of library and information services is also often tedious, repetetive, time consuming and uninteresting but users of such services nearly always demand information on the spot they like to identify the information instantly and they need that information right away if not yesterday.

As recorded human knowledge has expanded so rapidly and the complexity of that knowledge is becoming unfathomable, librarians and information specialists have become aware of the need for new methodology to treat information materials more effectively. Development of electronic computing technology has been a welcomed solution for librarians and information specialists in handling information materials.

If a library is operating in an advanced country where the letters of its written language are in the Roman alphabet there should be no great problem to bring computer facilities into the library operation. However, if that library is operating in a country where the letters are not in the Roman alphabet but different characters then there could be many complications and problems.

This paper will try to describe problems in computerization of library and information services in developing countries and suggest possibilities of overcoming such problems based on the experience in a country where so called CJK problems are dominant.

II. Computerized Library and Information Services

1. Modes of Library and Information Services.

Library and information services change modes of operation as information materials and needs for information change their modes and media. Today many librarians face an overwhelming quantity of information materials from which they have to select, discard, process and retrieve as the need occurs with rapidity. Special librarians face this more so than others. Librarians in advanced countries began application of computers for library services in 1950s, and during the 1960s the trend became forceful. F.G. Kilgour reviews the development in four areas of library services.(1) The first automated area was cataloging, followed by serials control, acquisition control and circulation control.

However, most of the earlier systems failed due to the lack of communication between librarians and system designers; inadequate computer technology; and the lack of imagination by librarians who participated in library automation.(2) Most of the earlier literature in the nineteen fifties and sixties are not evaluative, and disasters and failures were rarely reported. However, the literature becomes rich and analytical in the late ninety seventies.(3) We can learn much from these experiences.

2. Reasons and Merits of Automation.

An automated circulation system will run routine and repetetive services and tasks such as the lending and return of library materials, overdue notices, renewals and reservations much faster and more accurately

than a non-automated system. It will also reduce the number of staff needed at the circulation area.
An automated administrative system such as ordering and accounting will provide better and faster information for library management and budget control.

An automated technical processing system for cataloging will result in the construction of a data base of holdings, and the public catalog could be discarded and on-line literature search could become faster and more interesting.
It could also be very useful for inter-library cooperation such as shared acquisition, cooperative cataloging and inter-library lending, resource sharing and be a means to join local, national or international information networks. An automated serials control system will reduce greater part of staff time and make the management of vast numbers of serials more bearable. When all or some of these systems are integrated and working well the library could reduce its manpower or use the excess manpower for better or extra services.

Services such as special bibliography, SDI, literature searching on specific topics, identification of certain information would improve greatly and information for management decisions would be prompt and accurate. However, enthusiasm for automation alone could bring disaster and confusion and all efforts for automation could be wasted unless the library plans the automation process very carefully.

The first priority in computerization of library and information services in developing countries must be given to automated cataloging systems and data base building in order to make local, international information exchange and interchange viable.(4)

3. Points to Consider Prior to Automation.

a) Control of planning:

When a library is planning for automation the head of the library should hold the control of planning and operation instead of delegating the responsibilities to his or her deputies.

The head should always remember that the responsibility is sorely his or hers. The success of the automated systems depends on good planning and good judgement. The head of the library should possess good knowledge of automation.

b) Analysis of library operation and needs for automation:

Prior to automation the library must have minute analysis of its operation, function by function, and define each function as accurately as possible. The library should also include functions and services not available yet but hoped for in the future.

When analysing needs for automation the library should consider two sides of each function; one from librarians' view point, and another from the users' view points. When describing an automated function of the library, aspects of future development and integration with other functions of the library as well as integration with other automated library and information systems must be considered.

c) Economic Feasibilities:

The library should consider economic feasibilities of automated library and information system. When the library has small staff and collection and fewer users, then a terminal connected to greater systems or data bases would suffice for their current information services. However, when a library has large staff, large collection and a larger number of users the library should analyse the cost of per item processing and the cost of per item service. When the cost for automated system is feasibile within the library's budget the planners should decide the priority of areas for automation.

d) Understanding of computer technology and automated systems:

Librarians should know as well as the system designers and programmers about the existing computer technology and future development; merits and demerits of existing automated systems. They should know the variety of hardware and software and examine them closely. They should know the limitations of computers and of systems. They should never believe in full confidence what the computer salesman tells them. They should also know the nature and the type of software by which the machine operates. If they are going to adopt an existing automated system they should study the system in various ways; the type, the size, scope, functions that the system performs, applicability, and growability of the system.

e) The Roles of project team & consultants:

When an organization has enough manpower to develop it's own automated system for library and information services librarians must participate in the project team. The project team should be comprised of a system designer, librarians and a few programmers.

They must collect all relevant information on library operations in order to do operation and needs analysis. They should explore the alternatives and then write up system specifications before the system design and programming. Selection of hardware is very important and future replacement of hardware must be considerd at the same time. Actual data conversion would take much time and manpower, therefore, careful planning of a process schedule is very important.

When a library is planning automation but lacks expert service within, the library should hire an experienced local expert if possible because experts from advanced countries are very expensive and often lack local knowledge. The role of such an expert is not for deciding but to advise and assist the project team on concerned matters as indicated in the above.

The project team should function till test operations with selected data samples are satisfactory and system manual is completely finished. Also it is highly advisable that the library or parent organization should retain the same programmers as long as possible.(5)

III. Problems in Computerization

1. Socio - Economic Problems.

a) Conservatism:

The major problems encountered in computerization of library and information services in developing countries especially in the Orient would be social, cultural and economic ones. A majority of the top managers of library and information services in the region are in the middle or upper middle age bracket and although they have received Western or Western styled education their attitudes are mostly conservative - traces of remains of influence of transcendentalism of Buddhistic philosophy and/or of confucian philosophy.(6) They are reluctant to change, especially concerning application of machines for their services, and any computerization effort without their understanding and support is impossible. It would require great patience and effort to persuade them to see the coming age of information and to take proper action.

b) Language:

The language barrier in the region is another problem in library and information services - even without computerization. Most of the up-to-date hardware and software operates in English. When a local language operated system is developed librarians and information specialists have to use a bi-lingual system because the majority of information they handle would be in foreign languages. If we focus this problem to the Far Eastern countries (China, Japan, Korea) we can see English and other European languages, Chinese, Japanese, and Korean, each with distinctive characters and systems.

If one is going to combine these languages into one information system there will be a great deal of problems hardware-wise and software-wise. Perhaps the best solution to date for information storage and retrieval purpose would be the system developed and operated by RLG.(7)

c) Economic Feasibility:

Normally in developing countries computerization of library and information services is an extra financial burden to libraries though economic feasibility is sufficient for computerization. In medium or smaller libraries the cost for library automation could easily over run the library budget. Therefore, priority for computerization should be given to automated cataloging systems in order to have a proper information storage and retrieval system and to join with other such systems locally or internationally. Other areas could be phased in as the situation improves.

2. Administrative Problems.

a) Understanding & Training:

Lack of understanding by people in the upper echelon of administration will definitly be an obstacle to the process of computerization of library and information services, however, too much enthusiasm of these people for the computerization may also mar the process. Such people would want everything done at once and expect that the computer would do everything and do it perfectly.

Persuading and convincing top managers is a necessity while training of the library staff for computerization is indispensable.

It is a difficult task to train a library staff properly for computerization in developing countries. More often than not the country may not have adequate facilities and the library has to send them overseas for training.

b) Computer center versus library:

An educational or research institute may have fine computing facilities but the director of the computer center may not respond favorably toward the librarians' approach. In such cases the prevalent reason for the negative response is that people at the computer centers are afraid that their facilities will be swamped with endless library chores. Unless the central computer center is equiped with several CPU's and enough peripheral equipment it is advisable for the library to have its own computing facility.

c) National information policy & infrastructure:

Lack of/or insufficient national information policy and national information infrastructure will put a library into a difficult position in computerization.(8) If there is no national MARC system, the library has to follow the internationally accepted MARC system, or initiate national MARC for the good of national library services. If there is no national standard for character code the library has to follow the widely accepted character code or initiate for a standard character code. A decision made by a pioneering librarian in computerization will greatly influence the future of his/her library and other libraries.

In developing countries it is very economical and efficient to have planned development rather than free development in computerization of library and information services. It would be more economical and time saving to develop a proto-type system by a pioneering group and let others adopt it with applications as needed.(9)

3. Technical Problems.

a) Cataloging Rules:

Libraries dealing with multi-lingual materials apply two or more cataloging rules, AACR and local cataloging rules.(10) While planning for computerization and adopting an established MARC format or developing a local MARC format, planners find the need for revision of local cataloging rules. This is the reason each MARC committee in the Far East had a working group or a sub-committee on cataloging rules.(11)

It might be against the principles and applications of local cataloging rules to adopt the principles and applications of AACR-II or ISBD but it would be better to follow the international trends for future information interchange.

b) Character Code:

One of the complicated problems in CJK countries and CJK literature is character codes for Chinese characters (Han-ja in Korean, Kanji in Japanese), Han-gul (Korean alphabet) and Japanese Kana. There are many ways to code these letters, e.g. by strokes, by sound or by meanings.

There are at least six published character sets developed by agencies in the East Asia for use in data processing. These character sets overlap in many ways but each contains characters not included in the others.(12)

When a research library is dealing with many CJK bibliographic data the library has to depend on the combined set of most of these character sets. The best combination reported so far is the one developed and operated by RLG's RLIN East Asian character code (REACC).(13)

c) Bibliographic control and quality:

In developing an automated cataloging system, people often overlook the authority file which is often regarded as an extra burden, thus inviting inconsistency and confusion in data records. If there is an agency where a national MARC system is maintained it would be easier for libraries to consult and/or contribute to their MARC authority file for the consistency of records.

In order to assure the quality of the data records, the library has to maintain a quality control group which will correct mechanical or human errors.

d) Engineering Problems:

Diversity of computing equipment and software will confuse many librarians. This diversity is caused by different designs and systems used by manufacturers and matching software to operate them. Librarians should search the market with an open mind and consult other automated library systems for the best choice. As for the technical improvement of hardware librarians could make suggestions for implementation of operating systems and let the engineers produce better products for better use in library applications.

IV. Possibilities in Computerization

1. Resource Sharing and Networking.

When libraries have automated ordering and cataloging systems and possibly serials control systems, resource sharing will be easily achieved. These libraries could maintain either a centralized union catalog of information materials or bi-lateral interchange of information through their computers. They can also plan better cooperative acquisitions and shared cataloging programs with much ease.

When they are operating on different systems, implementation for information interchange is needed. When it is done they could form a network - local or national - for information services. This network could be linked with foreign networks, and libraries could search information from foreign data bases.

2. Priority and Process of Computerization.

* Development & operation of the national MARC system

  ↓

* Development of proto-type automated library and information services (PALIS)

  ↓

* Adoptation and application of PALIS by individual libraries and information centers.

  ↓

      Cataloging
      Acquisitions
      Serials
      Circulation

* Formation of local network for information exchange

* Construction of local data bases

  ↓

* Cooperative programs through networks

  ↓

      Acquisitions
      Cataloging
      Inter-lending
      Information exchange

* International exchange of information

V. Computerization of Library and Information Services in the Republic of Korea

1. Individual Efforts.

A report published in 1983 cites 8 cases of computerization of library and information services in Korea.(14) The report neither indicated the dates or the stage of computerization, nor described the systems. Also the report was not accurate. KORDELA Journal No.2(1982) carries detailed reports on 3 library and information systems in Korea,(15) and a paper presented to the Second Asian-Pacific Conference on Library Science, 20-24 May, 1985, at Seoul(16) reports on computer applications in 8 research libraries and their joint program, 2 university libraries, and 2 national libraries and Korean MARC system.

A survey made for this paper and other purposes in mid June 1986(17) indicates the computerization of library and information services in Korea as follow:

Lib.	System	Hd-W	Date	Services
National				
CNL	Korean MARC (KOR MARC)		1981-	Mag. tape Printed cards
NAL	Korean Periodicals Index		1983-	KP Index
	Serials Control		1983-	Holding list
University				
DEU	Cataloging (KOR MARC)		1981-	On-line
	Ordering		1982-	"
	Circulation		1982-	"
HIU	Retrieval (DACOMNET) + DIALOG	MV-8000	1984-	Search on request
	Others: Planning		1985-	
	Staff Training(3)		1985-	

KU	Serials Control	-	Planning	1983-	
KBU	Serials Control	-	Planning	1983-	
KSU	Cataloging	-	Planning	1985-	
SNU	Under Study			1980-	
YNU	Under Study			1986-	

Research

AKS	D/B Biodata			1983-	Scholars on
	Lib. Sv.				Korean Studies
	Under Study			1983-	
KAERI	D/B TRRS		CDC	1983-	On-line
	INIS			1979-	Batch
	+ DACOMNET			1984-	On-line
KAIST	Serials Control		IBM/CDC	1972-	
	Cataloging			1978-	On-line
	+ DACOMNET			1982-	Search on request
	+ DIALOG, etc.				
	D/B. R & DRS			1981-	On-line
	KSE			1982-	"
	CR & D			1983-	"
	ELIPA			1979-	"
	BIBLIS			1978-	"
KDI	Order	Ryomo	RS 83	1985-	On-line
	Cataloging			1985-	
	Circulation			1985-	
KEDI	Circulation		VAX 750	1985-	On-line
	Cataloging		Planning	1985-	
KETRI	D/B INSPEC			1983-	On-line
	+ Local Location				
	Cataloging				
	+ Hangul Keywords				
	+ KAIST				
	+ DACOMNET				
	Circulation		Planning	1985-	
KIET	D/B KSEA		IBM	1983-	* Batch
	UNICAT			1983-	Search on request
	KSEU			1984-	
	KSEJ			1985-	
	KOSE			1985-	

	TECH		1985-	
	CA Search 1975.7-		1981-	* Batch
	INSPEC 1977.7-			SDI
	WPI 1979.6-			Search on request
	ISMEC 1977.7-1983.12.			"
	COMPENDEX 1978.10-1983.12			"
	NTIS 1979.6-1983.12.			"
	CIN 1979.1-1983.12.			"
	Other D/B on Major Networks			Search on request
	Serials Control		1985-	Batch. Holding list
	Cataloging		1985-	On-line
	+ DACOMNET		1985-	" * Soon to be on-line
KIER	Terminal		1985-	Search on request
	+ KAERI			
	+ KAIST			
	+ KETRI			
	+ KIETNET			
	+ DACOMNET			
KSRI	D/B SRDS		1981-	On-line
	Cataloging		1981-	"
	+ DACOMNET			
LCRI	D/B Tech-Info	GS Mighty	1985-	
	Pyrethroid		1985-	
	Circluation Cataloging >	Planning	1985-	
	+ DACOMNET			
KRIHS	Cataloging		1983-	On-line
	Circulation		1985-	"
	Ternianal			
	+ DACOMNET			
TMD	Serials Control		1982-	On-line
	Cataloging		1982-	"
	Circulation		1982-	"
TYRC	CA Search	NAS-AS-6630	1982-	"
	TOPICS			

From this survey we can easily deduce the fact that:

a) Computerization in research library group is most active in Korea, and

b) Research library group is very anxious to get bibliographic information for users, and

c) Ordering and circulation controls are by-products of information S/R activities. Also the author found that most of the systems were originally designed by the staff of a parent organization except in two cases and imported D/Bs.

2. Cooperative efforts.

a) Korean MARC:

Although many librarians from various libraries participated in developing the KOR MARC system a shared cataloging is not practiced yet. Only one university library is able to transfile KOR MARC tape so far, since RLG-K needs a small number of KOR MARC records they simply do not use KOR MARC tapes.

b) Research libraries in R & D complex formed a core network since 1972 and maintains cooperation programs in shared acquisitions, inter-library lending, union catalog, and shared construction of data bases.

3. Future plans:

RLG-K plans to:

a) Have on-line RLG network of library and information services by 1989 and expand the network to include university libraries by 1992.

b) Develop a proto-type computerized library and information system for adoptation and application by other libraries.

c) Realign the national information network with the support of Ministries of Education, Science and Technology, and the Economic Planning Board. (5 year Development Plan, 1987-1991)

KORMARC program will become more active by 1988 after the CNL move into a new building. (5 year Development Plan, 1987-1991)

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VI. Conclusion

As we are living in an information age and EDPS is economically feasible for handling information, thanks to the development of electronic technology. There is no way to turn but to join the computerized library and information family. Some people object to the domination of the advanced countries in the information field but the developing countries need advanced information for their development. We can all try for the sharing of information in fair conditions.

If we in the developing countries are not prepared for regression in our technology and economy we have to cope with the difficulties and problems that the advanced countries have experienced, and we know we can do it in shorter time than they did.

Library and information services in developing countries is presently in a transitional stage and most of the top planners for modernization programs in these countries tend to overlook or give lower priority to the program for development. It is the duty of library and information workers to persuade policy makers and the public of the importance of information services.

Discussions and recommendations alone will not convince them. Librarians should provide them with some results of what they have done, and show them what can be done and what should be done, information wise, for national development.

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PRE-SESSION SEMINAR TOKYO 1986

Special Libraries and their role in National Development

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PRESESSION-12-E

The Importance of Patent Information and Its Implication for Developing Countries

by

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Industrialization is the road that developing countries embark on to improve and diversify their economy and to improve the quality of life of their citizens. The process of industrialization involves the importation of technology from the developed countries. In the importation of technology, there are many examples of costly mistakes in developing countries. Such as the unsuitability of technology imported to the local conditions, or the need to import raw materials to feed the production instead of using local raw materials, or having to pay high licensing fees to import outdated technology or to pay for new technology only to be used as a pilot plant to prove that technology, without the developing country benefiting from the patents that are derived from innovations resulted. These are not the only problem, often too there is a total lack of the transfer of technological know-how, especially for the creation of local technical expertise and innovation.

Decision making needs information, and especially decision which involve millions of dollars. Information that will help in the selection of an appropriate technology and in licensing negotiations too to be information that is industry oriented and problem and technologically specific. Such types of information are often found in patent documents, because it is industry orientated, it is important and has implication to to developing countries. I shall look at the characteristics of patent documents that make information contained in it important and how developing countries can use it to their advantage.

In the area of scientific and technical information search and retrieval, librarians have a natural tendency to overlook patent documents as a source of technological information. It may be because of the legalistic language in which patents are written in, or that each patent document itself is very specific or highly specialised, or that the tools with which to access patent information are not readily available. Patents in addition have their own classification which in no way resemble the logical library classification. All these tend to put a barrier between librarians and patents But whatever the reason for not using patent information, the very nature of a patent document makes it a very important source of technological information.

Let me at this point define some of the terms that will crop up in this paper. In this discussion, the term technological information means scientific and technical information that is industry oriented and can be applied immediately to actual situations. Although scientific and technical information also refers to technological information, in general it almost always refers to periodical articles or research results containing emperical data which has to be furthered tested before application to actual situations.

The nature of a patent document is that it is an agreement between a government and an inventor whereby for the exclusive right to exploit his invention, the inventor must disclose fully his invention. This being so, the inventor must fully describe in the complete specification the best method of performing the invention. Of course the legal language in which the invention is often described in, renders it difficult to access the information. But it does not in anyway remove the fact that patent documents contain technological information that is often more specific to a solution than scientific and technical information found in published literature.

CHARACTERISTICS OF PATENT INFORMATION

What are the advantages of patent information over other types of information?

A patent is a legal document, an agreement between a national government and an inventors whereby the inventor discloses his invention to the public in exchange for an exclusive right of exploitation for a fixed period. It is important to note that it involves an invention, in the context of patents it is generally accepted that inventions are solutions to technical problems, in that it must be usable in practice and in industry. Because it is usable in industry, inventions and patents are economically valuable. These will enable industry to make new products, more products economically or improve existing products. The state by granting the inventor the exclusive right of exploitation requires that the inventor places the technological information surrounding his invention in the public domain.

Patent documents in addition to the name and address of the patentee will contain:

a) A brief and very precise indication of what the applicant claims to be his invention.

b) An explanation, describing the existing background and knowledge on which the invention is based and the contribution that the invention will make in such background knowledge.

From what is contained in the patent document, it can be seen that as an invention it must necessarily be something that is new or an improvement of existing technology. In addition the patent also discloses the state-of-the-art of the field of the invention i.e. a history of the technological progress in the field to which they relate and possible future technological trends. From this it can be seen that patent documents give quite a comprehensive review of the state of technology in the related fields. They disclose not only the concept covering the invention, but also give detail information on the possibility of its practical application in industry.

In summary it can be said that the special features of patents are:

a) They contain the most recent information. The fact that the inventor wants to exploit his ideas before anyone else, makes the patent documents the earliest source of information. There are some well known cases of important inventions disclosed first in patent several years before their appearance in literature form, for example:

	Date of Published Patent	Date the information[1] published in other literature
Hollerith (punch card)	1889	1914
Baird (television)	1923	1928
Whittle (jet engine)	1936	1946
Morrogn (ductile cast iron)	1939	1947
Ziegler, Natta (polymerization catalysts)	1953	1960

b) They give information not only on the general utility of the invention but also in its practical application in industry.

c) They disclose information that is not found in other literature. A recent survey by the US Patent and Trademark Office shows that as much as 70 of the technology disclosed in US patent documents from 1967-1972 has not been disclosed in non-patent literature[2].

d) They disclose technological information on what is new and what is known.

PATENT INFORMATION AND TECHNOLOGY TRANSFER

It has been said that the technological capability of a country is reflected in its patents. This is seen in the fact that although some 70 countries have patent documents, approximately 80 are published by 12 countries, these are Japan, Germany (Fed. Rep.), USSR, USA, UK, France, Canada, Spain, Sweden, Australia, Holland and the European Patent Office.

It is accepted that science and technology are potent agents of development. They have an impact on development in that they generate change and growth, in that it encourages the adaption of new ways of looking at things and the expansion of production of goods and services. The application of science and technology to development improves productivity and this in turn produces changes in the quality of life. One of the way that is open to developing countries in improving productivity is to process their own raw materials into value added products or manufactured products. This necessarily involves the process of industrialization.

The lack of internal technological capacity here leads naturally to the importation of technology. The importation of technology has its problems not the least among which are:

i) Imported technology often do not utilise local resources or raw materials.

ii) The export of the manufactured products are often restricted under the terms of the importation.

Licensing negotiations:

Because of the generally weak technological base on which developing countries operate, they generally enter into technology transfer agreements in a disadvantaged position. This is especially so in the selection of technology that is appropriate to the industries in a country. It is here that patent information because of the vast amount of data that it contains can play a fundamental role in technology selection and technology transfer negotiations. The information that patent documents contain provides not only a range of alternative technologies that is available but also alternative sources of technology. This kind of knowledge only helps strengthen the position of developing countries in technology transfer negotiations.

Research and development:

The importation of technology is only the first step on the long road to industralization and the creation of indigeneous technological capability. It is vital for developing countries to create its own indigeneous technology if it is to move into the ranks of the developed nations. In this task patent information is especially important. The creation of indigeneous technology is an extension of the importation of technology. Imported technology is almost not always totally matching to the local economic and technological conditions. It is here that the technology must be adapted to match local conditions. Because patent documents contain information on related and alternative solutions to a problem, these information can be fully utilized in the modification process. In the process of modification local technical capabilities are built up, and in the process create new inventions suitable to local conditions.

It must be remembered that patent documents are not secret documents and the information contained within are freely available. These information can be freely used to support research and development activities. In this area information on previous work done on the same or related field can reduce the risk of duplication work already successfully completed and also give much information about the methods, instrumentation and results and the directions of future development and trends. Patented technologies are not the end of the line, every invention marks the starting point for the next advancement in technology. Patent information as such facilitates the identification of important trends in research and development and also information for effective and readily applicable technical solutions to R & D problems.

While the importation of licenced technology is the legal way towards industrialization, the counterfeit way is another. In cases where the patent is not protected in the country of the user, then the invention can be even put into industrial application. The only restriction is that the products cannot be exported. While I am not advocating this method of the industralization ,one can see that there are positive benefits to ithe industrialization and the development of local technical expertise. One can recall the copies of apple computers that were produced in this region. But gradually as they develop their expertise, they begin to innovate and invent, and now their products are no longer copies and in many cases are more advanced than the original. A more legal method is in the utilization of lapsed patents or patents that have not been taken up for renewal. Although lapsed patents are old technology, it must be remembered that in developing countries it is often the case that these may be the technologies that are most appropriate to the state of technology and development at that point in time. These technologies can also serve as starting points for countries to devleop their own local expertise. Information on lapsed patents can prevent the countries importing the technology from having to pay unnecessarily or accept restrictive conditions for something that is no longer protected.

It is the industrial area that patent information will have its biggest impact. It is fair to say that no one will give you new technology or even old technology free . Organizations that have technologies to offer will be most reluctant to licence unless on very profitable terms. Technologies of the developed countries are not generally geared to the conditions of developing countries. So the selection and evaluation of the most suitable technology for licensing is a complicated and difficult especially when organizations selling technologies rarely give complete and unbaised information. It is here that patent information can shed some technological light. Patent information is useful in the identification and location of possible suppliers of technologies as patent documents contain the names and addresses of the inventor. In addition because patent documents contain information on related documents and existing knowledge, these information can be used by industry to evaluate and select from all the alternative technologies available. The disclosed information on the practical application of the invention helps industry to use the selected technologies.

Technological development is progressing at such a speed that for countries to compete or progress, they must make effective use of information at different levels. This is one of the vital ingredients for success of a country's industrialization program. Information resources must be effectively utilized if a country's industry is to remain competitive, it must be viewed as a strategic economic resource. One source of this strategic economic resource is patent information.

The ultimate aim of industralization is in improving the quality of life. But economic development and industrialization cannot be measured by the number of industrial plants established. The success of industrialization is in the upgrading of a country's technological capabilities in terms of local technical expertise, and local creativity in innovations and inventions.

Whole scale importation of industrial plants, where no or little transfer of technology is involved is costly to the developing country. Together with the restrictive marketing conditions which usually accompanies such importation, developing countries often only receive obsolete and non-competitive technology.

The fact that developing countries are already disadvantaged by starting from a lower technological level and with limited technical manpower, makes the evaluation and selection of technology difficult. Companies in developed countries with technology to sell are not going to provide much data on alternative or competing suppliers. Consultants from developed countries, because of their lack of knowledge of local conditions do not always provide the most ideal solution Where then can developing countries obtain such information. The one source of help for developing countries is in patent information, and it is freely available.

The nature and characteristics of patent makes then a valuable source of technological information. The fact that in developed countries, corporations maintain large department of patent information specialists to monitor the trends of technological development in their area of operations reflects the importance attached to patent information. Governments in developing countries could use these same techniques to formulate development and industrial policies. Entrepreneurs in developing countries can use patent information to identify alternative suppliers, and technologies. These information help strengthen the position of the developing countries in negotiations for industrial plants and technology transfer.

The accelerated growth of specific and technical information is difficult to keep ace with. But not all information is useful to developing countries. Valls and Sherwood's[3] survey on access to international databases found that there is a low relevance of information in the databases to the regions (Southeast Asia) problem. Librarians in developing countries have to be selective in the type of information that is most appropriate to their specific local need. Perhaps rather than looking towards international scientific and technical data bases for information to provide solutions to technological problems, we should be using patent information more often. Rather than looking at patents as only a legal document, we should look at these documents as a valuable source of technological information. And why not, the information contained in patent document is up-to-date, complete, practical and is industry orientated.

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IFLA GENERAL CONFERENCE, TOKYO

PRE-SESSION SEMINAR TOKYO 1986

Special Libraries and their role in National Development

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PRESESSION-13-E

Towards productivity gains : the role of high technology, abstracting and indexing services in national development.

by

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Towards productivity gains : the role of high technology, abstracting and indexing services in national development.

Abstract :

Dissemination of scientific and technical information is essential for economic development in Singapore. The problem of "information explosion" has resulted in the ever decreasing time span between the scientific discovery and its application and the impact of scientific activities on environment. Indexing and abstracting services seem to be the best solution to this problem. Incidentally, the present technology has made it possible for the librarian to meet the challenge of the "explosion". Thus, efficient library services will raise productivity which has been an important focus of economic restructuring. This paper accounts briefly the scientific information facilities in Singapore libraries, particularly special libraries. The important services provided by these libraries to keep users abreast of the latest development in their areas of specialization and interest are also described. Mentioned also are the problems in resource sharing in special libraries and recent developments in the Singapore library scene.

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1. INTRODUCTION :

The Republic to Singapore is a city state consisting of Singapore island and some fifty-seven islets with a total area 620 square kilometres located at the Southern tip of Peninsular Malaysia, at the junction of important sea, air and trade routes, between the West and the Far East. It is this excellent location coupled with the enterprising people attracted to the island since it was founded in 1819, that has resulted in the transformation of the island from obscurity to international prominence.

In 1980, the Singapore Government's economic policy set out the directions for development in the 1980's. The most significant change was the restructuring of the industries from labour intensive to capital intensive, high technology and high value-added, through automation, computerization and the upgrading of operations to raise productivity, as well as through the development of skilled manpower. In order to succeed in the high-tech policy, the government has laid much emphasis on the promotion of research in the field of science and technology. The emphasis on research has resulted in the establishment of a number of Research and Development Centers and a growing demand for science and technology information (STI). Thus, the libraries acquiring scientific and technical literatures play a vital role as information support mechanisms to their parent organization as well as in promoting national development.

As part of the economic policy, the Productivity Movement was launched in 1981. One of the key areas in a total approach to productivity is investments in technology (both in production processes and office automation). Information technology also holds great promise as a means to achieving productivity gain, particularly in the area of office automation. The development of high tech and the productivity movement is essential. It is the responsibility of sci-tech libraries to provide efficient services in order to keep users informed of their areas of specialization and interest through automation as a means to raise productivity.

2. SCIENCE AND TECHNOLOGY INFORMATION AND LIBRARY FACILITIES IN SINGAPORE

The writer has sent a questionnaire to thirty-nine libraries and organizations taken from the list of Library Symbols in Singapore published by the National Library for the purpose of writing this paper (see Appendix I). She admits that this survey is not comprehensive since it excludes many other organizations not found in the list. Furthermore, the response to this questionnaire is rather poor, as only thirteen returns were received, ie. 33 per cent. However, the writer made an effort to conduct either personal or telephone interviews with the libraries which did not respond. As a result, this preliminary analysis from the questionnaire returns gives some insight into the resources available and services offered by special libraries in the field of science and technology (sci-tech).

Presently, the demand for STI in Singapore is met by various types of libraries, special collections from the National Library, libraries of educational institutes and special libraries. Special libraries with STI can be categorized into libraries of statutory bodies, government departments and non-government organization. The activity of special libraries is directed towards the tasks and needs of their departments or institutes. These sci-tech special libraries are generally affiliated with scientifc and research departments or institutes. Their main responsibility is to collect literatures for scientific work, process and make it available to the scientists and research workers.

2.1. LIBRARIES OF STATUTORY BODIES

The rapid growth of special libraries took place significantly in the 60's and the 70's. Most of the sci-tech libraries in Singapore belong to the statutory bodies. These special libraries have their own wealth of resources to serve their own special clientele from various sectors. The earliest library of this kind was founded in 1960 by the Housing and Development Board (HDB). The Library's collection reflects the Board function in that its major subject areas are on architecture, civil electrical and mechanical engineering, building, planning, public services and utilites. The book collection consists of over 12,000 volumes and to keep abreast with technology, the Library subscribes to 110 periodical titles.

The Civil Aviation Authority of Singapore (CAAS) which was founded in 1970 maintains 6,000 volumes of books and subscribes to / receives more than 75 periodical titles on aviation, aeronautical engineering, radar, air transport and airports.

Founded in the same year, the Telecommunication Authority of Singapore (TAS) Telecentre Library has resources on telecommunication, telephone, telegraphy, radio, microwave satellite communication and related electrical and electronic engineering subjects. It has approximately 21,000 volumes of books and subscribes to 400 titles of periodicals.

In 1971, a library was founded by the Port of Singapore Authority. The Library resources cover architecture, shipbuilding, engineering and management. It has also developed a collection of publications issued by foreign ports. To date, a total of 20,000 volumes of books were acquired and the Library subscribes to 400 titles of periodicals.

In 1972, an Industrial Technical Information Service of SISIR (Singapore Institute of Standards and Industrial Research) was set up within SISIR to cater to the scientific and technological needs of commerce and industry in the Republic. Today ITIS has been further developed to cater to the needs of the Institute in its standardization and quality assurance activities and also developed into a materials technology and application centre in Singapore. SISIR's ITIS provides technical information covering more than 100 subject categories of industrial activity, including management and personnel activity. The SISIR Library holds a complete collection of all national and international standards, at present totaling over 240,000 standards besides a wide selection of 895 titles of current technical periodicals and 30,000 volumes of publications and reference materials. The reference materials have been acquired essentially to provide comprehensive technical information support to the institutes programme areas and are used extensively by industrial personnel to keep them well informed of technological developments.

In 1981, the Resource Library of the National Productivity Board (NPB) was founded. Its mission is to establish and

and develop a comprehensive collection of print and audio-visual materials on productivity-related subjects to support the Board's training programmes and Productivity Movement. The Library has 9,000 volumes of books focussing on various aspects of management, industrial and operation engineering, occupational health and safety as well as other productivity-related subjects. It subscribes to 200 titles of periodicals, and a total 1,000 AV materials and 100 slides package have also been acquired.

Following the recommendation of a high-powered Committee on National Computerization to establish computer training centres to produce the needed computer professionals, the active promotion of computerization in the civil service and the promotion of the software industry, the National Computer Board (NCB) was established in 1981. The Library has a total collection of 1,400 volumes of books and subscribes to 50 titles of periodicals on computer sciences.

In 1982, the government announced the decision to proceed with the implementation of the Mass Rapid Transit (MRT) system. The system will connect the densest satellite towns to the main financial and commercial districts, providing a fast, safe and reliable transportation alternative to congested surface street transport. Its most recent established Library supports the parent organization's activities by maintaining a small collection of 500 volumes of books, technical studies and reports. The Library collection which is still in the process of development, focusses on engineering, transport and construction.

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The Singapore Science Centre, a major institution for the dissemination of scientific knowledge in Singapore, houses over 400 exhibits on various aspects of science such as physical sciences, life sciences and aviation. The Centre also organizes programmes to promote public interest in science and technology. The Library has a collection of over 5,000 books and subscribes to 90 titles of periodicals. The general objective of the Library is to provide the staff with reference materials in the preparation of science exhibits. As such, over 90 per cent of the books have a special emphasis on pure and applied science.

2.2. LIBRARIES OF GOVERNMENT DEPARTMENTS

The libraries of the second group of sci-tech libraries are attached to the government departments. The activities of this group of libraries are directed towards the task and need of the departments. Generally, the number of scientific libraries in the government departments are small but the resources available are large. A few libraries had their origins in the colonial past. Five particular libraries will be mentioned, namely libraries of the Botanic Gardens, Marine Fisheries Research Department, Defence Materials Organization of the Ministry of Defence, the Primary Production Department and the Public Work Department.

The present Botanic Gardens of 85 acres were founded in 1859 and are a popular public park as well as a research centre for Malaysian botany and tropical horticulture. The Botanic Gardens Library possesses the most complete set of botanical journals in the region and the best reference collection for taxonomical research in the region. It has a strong collection of 14,000 volumes of books and subscribes to sixty-six periodical titles and other audio-materials on horticulture, botany, ornithology, soil sciences and landscaping. The Library is referred to by staff members, botanists and researchers preparing taxonomic revisions and floristics studies in the region.

The Marine Fisheries Research Department (MFRD) is one of the three departments of the Southeast Asian Fisheries Development Center (SEAFDEC). The Library was set up in 1969 to meet the need to develop an effective reference library for fisheries and aquatic sciences in the region. It specializes particularly in the fields of fisheries, aquaculture oceanography and food science / technology. The Library collection consists of 17,000 volumes of books, technical reports and periodical articles. It currently subscribes to twenty periodical titles. Clientele served includes staff of the department, government departmental libraries, the National Library and libraries of tertiary institutions as well as researchers from Southeast Asia.

The Primary Production Department (PPD) of the Ministry of National Development is responsible for the implementation of the government policies on agricultural and fisheries development in Singapore. The Department has few decentralized libraries which acquire agricultural, fisheries, veterinary public health and animal quarantine materials.

The Defence Materials Organization Library is one of the three different libraries attached to the Ministry of Defence (MINDEF). Founded in 1970, the Library has more than 18,500 volumes of books, technical reports, standards and specifications. It maintains 100 subscription of periodicals on specific subject areas which include engineering, military engineering, applied sciences and technology as well as pure sciences.

The Public Works Department (PWD) is responsible for the planning, design, construction and maintenance of public buildings, airports, flyovers and expressways. The PWD Library was founded in 1980 and it has a collection of 30,000 volumes of books, British Standards, project papers and annual reports together with audio-visual materials. Its library collection emphasises architecture, engineering and management.

2.3. LIBRARIES OF NON-GOVERNMENT ORGANIZATION

The only non-government library that merits special mention for its scientific resources and library services and facilities is the Singapore International Airlines (SIA) Central Library. The SIA has played a major role in the Government's effort to develop the tourism industry in the country. The Library was founded in 1970 and its collection places special emphasis on the field of aviation. Its holding includes 4,000 volumes of books, 8,000 titles of periodical articles and currently it subscribes to 700 periodical titles.

2.4. SCIENTIFIC RESOURCES AVAILABLE IN OTHER LIBRARIES

Although the main concentration of this paper is in special libraries, there are a number of libraries which cover the field of scientific information and deserve special mention.

2.4.1. NATIONAL LIBRARY

The Business, Scientific and Technology Section of the References Services Division of the National Library was set up to service industrialists, students and laymen. The Section maintains a special collection of some 30,000 volumes of reference materials and about 1,000 current periodicals which contain a wealth of information covering almost every field of business, science and technology. As a public library, the scientific and technical collection is remarkable. It has a rich collection on scientific and technical literature published in Singapore, since the National Library is also a depository library for all literature published locally. References and information services are offered to all users. Demand for literature is very heavy and this is carried out either by using resources available in the Library, through local inter-library loan or with the assistance of NLDC-SEA (National Libraries and Documentation Centre - Southeast Asia) Consortium Officer, the British Library or Australian National Library. The Reference Services division also acts as a referral centre for the computer-based information retrieval service provided by SISIR.

2.4.2. LIBRARIES OF EDUCATIONAL INSTITUTIONS

Since mid-1970, there has been a shift in emphasis towards higher skills and technology and the decreasing demand for blue collar manpower resources. As a result, all tertiary institutes have reviewed and restructured their curricula accordingly with an orientation towards science and technology. Consequently, libraries of these institutions have also been reoriented to meet the new needs of the parent institutions.

The Singapore Polytechnic Library, as an academic library, serves primarily students and faculty members of the Polytechnic. The Library has a very good coverage of the discipline taught. It has a stock of 145,000 volumes including 12,000 bound journals and subscribes to nearly 1,050 journal titles on technical and engineering fields. Other library services offered include current awareness service, bibliographies and documentation services and loan services. The Library has also an information service to industry and the academic staff contributes regularly to the SISIR Current Awareness Service database and over the years this source has been invaluable.

The National University of Singapore (NUS) Library which is the oldest and largest academic library has evolved through the decades and comprises now a Central Library (housing collections on humanities, social sciences, engineering, accountancy and business studies and architecture) and four specialised branches (Chinese, Law, Medicine and Science). While its primary function is to serve the students and academic staff, the Library also extends its information service to industries on request.

The Medical Library of the NUS is the major medical library in the country and is reputed to be the largest in the English Language in Southeast Asia. With a collection of almost 120,000 volumes of books, periodicals, theses and other non-book materials in the biomedical, clinical and health sciences, the Library provides a comprehensive range of information services to the whole medical and health service community. This Library also provides many facilities and services such as compilation of bibliographies, current awareness service, securing photocopies of articles not available in the collection for teaching staff, indexing of locally produced periodical articles and inter-library loans. To meet the heavy demands for literature services, searches are carried out either by using resources available in the library, or on-line through the MEDLARS (Medical Literature Analysis and Retrieval System) services, provided by SEAMIC in Tokyo or the Australian National Library in Canberra or DIALOG.

The Ngee Ann Polytechnic provides technician education in engineering, shipbuilding and repair technology, building maintenance, management and computer studies. The resources of the Library consist of 74,000 volumes of books, 780 current periodical titles and some 24,000 items of all AV materials which have developed to support courses of study offered at the Polytechnic. Library services offered include Reference and Information Services, User Education Programmes, Interlibrary loan and bibliographic sessions which cover basic and special reference materials such as abstracting, indexing and bibliographical tools, literature searching and information retrieval so that students can make optimum use of the resources available.

The Nanyang Technology Institute (NTI) was established in 1981, to provide engineering studies at university level with an emphasis on engineering applications. The Library collection comprises 50,000 volumes of books and it subscribes to 370 titles of periodicals. To cater to the need of library users, the Library provides a variety of reader services, including loan of library materials, information searches and library user education.

The Institute of Education is the only tertiary institution in Singapore for the training of new teachers and the professional advancement of trained teachers. The Library has a good collection on the study and teaching of science and technology in relation to the school curriculum. The sci-tech resources constitute 10 per cent of the total library collection. Presently, its sci-tech collection consists of 12,000 volumes of books and it subscribes to 109 periodical titles.

The Vocational and Industrial Training Board conducts institutional training at 15 training institutes under its charge. The courses offered at the training institutes are graphic / interior design, electrical, electronic engineering, mechanical engineering and business studies. The Library which was founded in 1979 has a good coverage of the discipline taught. It comprises 12,700 volumes of books, 4,000 volumes of technical reports and 2,300 items of audio-visual materials. It currently subscribes to 300 periodical titles. Traditional library services such as current awareness, bibliographical literature searches, and bibliographic and documentations services are provided by the Library.

3. SERVICES AND PROJECTS UNDERTAKEN BY SPECIAL LIBRARIES

Special libraries, however, provide a wide assortment of services. They include references and loan services, current awareness services, indexing, abstracting and bibliographical and documentation services.

3.1. CURRENT AWARENESS SERVICES

The formidable flow of scientific and technical literature in recent years poses problems to management, engineers, scientists, technical personnel and researchers, who experience difficulty in finding time to select relevant information and to maintain a comprehensive collection of the available publications. To keep users aware of the developments in their areas of specialization and interest, many special libraries reproduce and circulate content pages of selected periodicals. The content pages service is an effective way to draw the attention of busy researchers to the new information that has just arrived and is available for use.

This service saves time and effort of users who have to keep track of relevant new information which otherwise would easily escape their notice. It is offered by HDB, MFRD, Botanic Gardens, MRT, TAS, DMO of MINDEF, and PWD libraries.

Another important service offered is the Selective Dissemination of Information (SDI). It is for the convenience of busy scientists and researchers who need to keep abreast of the latest developments but have little time to search or constantly watch for them. Scanning and selection of information for circulation to appropriate users is rather time-consuming effort but it is one of the most essential tasks of the library. The SIA, PSA, SISIR and NPB libraries offer this service to their users. The NPB provides a valuable information service, namely the Productivity Information Service (PINS) to its library subscribers and SDI service is included as part of PINS.

Most special libraries issue an accessions list as this is a basic and important service that every library should offer to inform its users regularly of new books and other materials acquired.

3.2. LOAN SERVICES

In most special libraries, loans of library materials are confined to staff. Libraries such as NUS, SISIR, NPB and PSA, however, extend their loan facilities to non-staff on a subscription basis. PSA has extended loan facilities to the Chartered Institute of Transport and the Institute of Materials Handling.

Since the collections in special libraries are highly specialised, there are necessarily limitations in materials coverage. They therefore, have to rely sometimes on local inter-library loans. Close co-operation and collaboration exists between special libraries and the National Library and libraries of tertiary institutions. Generally, inter-library loan facilities are easily available in Singapore and special libraries do not encounter any difficulty using the resources of another libraries.

3.3. BIBLIOGRAPHICAL AND DOCUMENTATION SERVICES

Increased established facilities in the decade led to further development of bibliographical services. Most special libraries offer bibliographical service in the form of issuing accessions lists, bulletins, current awareness lists and newsletters. Libraries like HDB, SIA, SISIR, CAAS, DMO, MFRD, PWD, PSA and MRT have occassionally compiled topical subject bibliographies based upon their special collection (Appendix 2).

Library lists of periodicals are an important bibliographical tool which enables staff and users to know the periodical holdings of the libraries as well as other libraries. Thus, their availability facilitates inter-library loan. The SIA, SISIR, MFRD, CAAS, TAS, DMO, PWD, MRTC and Primary Production libraries compile lists of the libraries' periodical holdings. Another important instrument which helps to keep users informed of the activities and developement of the library is a periodic newsletter or bulletin. CAAS, and PSA issue library bulletins which contain abstracts of periodical articles on aviation and world shipping respectively.

In the area of bibliographical co-operation, much is achieved by the creation and compilation of the Union Catalogue of Scientific and Technical Serials. This Union Catalogue represents the holdings of NL, NUS, Singapore Polytechnic and special libraries. In 1977, the catalogue was computerized and published jointly by the NL and SISIR. Library location symbols are taken from the List of Library Symbols compiled by NL. A more recent undertaking is A preliminary list of periodicals in special libraries issued by the Special Libraries Committee of the Library Association of Singapore in 1984.

4. INDEXING AND ABSTRACTING SERVICES : THEIR ROLE IN NATIONAL DEVELOPMENT

The problem of keeping abreast of sci-tech literature is almost staggering. We are deluged not only with a great number of scientific and technical book but also a veritable flood of journals, translations and reports which pour from the printing presses and duplicating machine in unending stream. Obviously, to turn anyone loose into this jungle of literature without guides and direction would be useless.

One of the greatest causes of waste in the business world today is the failure to use accurate and up-to-date information. A scientist and research worker need information at one time or another, and unless the desired information is quickly available, he loses much time and therefore money in searching for it. Unless information has been recorded and indexed properly and unless he uses the index correctly, he may not be able to find the information he wants. He will then repeat the past unneccessarily, redoing work that has already done by others, a process which is extremely costly in terms of wasted time, effort and money.

In view of the tremendous amount of literature that is being published, indexing and abstracting services are the solution to this problem. These alerting services are important and useful aids to scientists and researchers in sci-tech libraries, as the most valuable and most-up-todate information is found more often in journals and technical reports rather than in books. The Library user cannot possibly read all current publications and similar documents pertaining to his field and he is thus obliged to restrict such reading to a continually narrowing fields of specialization and to rely on indexes and abstracts or summary reviews to be aware of important developments and trends in his own and related fields. Indexes are the excellent starting point in users' research. When a research project is initiated, a thorough search of the literature reveals what has already been done and thus avoids costly and unneccessary duplication of effort. From browsing through indexes and abstracts, the user can select the items he thinks are worth reading, thus saving his time and effort.

In the Singapore context, where the Government places special emphasis in the promotion of productivity, a well organized library which can provide an up-to-date information and efficient service is one of the starting points of productivity improvement. Thus, the use of indexes and abstracts speeds up literature searching and increases efficiency and productivity as the subject grouping enables users to locate all works that deal with the particular subject.

4.1. INDEXING AND ABSTRACTING SERVICES OFFERED BY SPECIAL LIBRARIES

Based upon the information gathered from the returns of the questionnaire, secondary services and systems in the form of indexing and abstracting offered by special libraries are limited. Only eight libraries offer indexing services,namely ; SISIR, MRT, CAAS, Botanic Gardens, SIA , DMO, PSA and NPB, whereas SIA, CAAS, PSA and NPB libraries offer a more sophisticated service, ie. the inclusion of abstracts of periodical articles.

Eventhough indexing and abstracting services are actually the specific services expected of special libraries, many librarians have plans to order such services subject to the availability of manpower, since these services are very time-consuming and demanding in nature.

In special libraries, indexing and abstracting are conducted as part of their current awareness service. The type of indexing and abstracting reported to be done by these libraries are confined to local and internationally published periodical articles, reports and newspapers on specific subjects pertaining to the holding of the libraries.

At present, the SISIR Library is actively engaged in an indexing service in order to keep the users informed of developments in its areas of specialization and interest. About 300 current periodical titles and technical publications are scanned by the Institutes's experienced senior staff and members of professional bodies. Articles on new technology, processes and materials covering about a hundred subject areas are selected, indexed, in accordance to the Library of Congress Subject Headings (LCSH) and stored in a computer database. Monthly print-outs of the latest references in a selected field are mailed directly to library subscribers without the need for a new research every month. This service also serves as an SDI for the library. It is backed up by a document procurement service providing copies of articles from periodicals or reports which are not available in Singapore.

Similarly, the SIA Library is also engaged in an indexing project in the field of aviation. Selected articles from 200 periodical articles and newspapers are indexed using LCSH and In-House Subject Headings. In additon to the SISIR and SIA libraries, other special libraries offered indexing services include CAAS, MRT, DMO, Botanic Gardens, PSA and NPB. These libraries index periodical articles, newspaper cuttings and technical reports on their subject fields. While some libraries index their materials in accordance with the LCSH, most libraries like MRT, Botanic Gardens and DMO use In-House Subject Headings to suit their highly specialized collections.

It was mentioned earlier that SIA, CAAS and PSA include abstracts to enable users to gain a better understanding of the contents of the articles as a whole. Abstracts offer an important feature not found in the index. This is the inclusion along with the bibliographical citation of a brief resumé of the article acquainting the users with its contents. Abstracting service relieve researchers of the necessity of consulting each and every original article of paper.

It is also observed that only well established libraries run by experienced staff and professional librarians provide abstracting and indexing services. This may be due to the fact that these services are very time-consuming and demanding in nature. Selecting suitable titles for indexing and providing abstracts of the articles are not easy tasks. These are highly specialized jobs and can be undertaken only by those who are expert in the subject. In the SISIR Library, the Institute's experienced senior staff and members of professional bodies render their services in scanning through periodicals for indexing. Even the academic staff of Singapore Polytechnic also contribute regularly to the SISIR database. In the SIA Library, an Abstracting Committe which consists of technical staff was formed to assist the librarian in locating suitable titles for indexing as well as to provide abstracts to the articles. Experienced librarians in PSA. NPB and Botanic Gardens select articles suitable for indexing.

Most special libraries do not have plans to publish their indexes as these services are intended for internal users only. Due to the fact that there is no access to each other's indexing sevices, the indexing projects of some libraries are therefore duplicated. Presently, SIA and CAAS libraries are involved in the indexing of periodical articles on aviation. Hence, there is a need for co-operative efforts to publish some of these indexes to eliminate duplication of work.

4.2. INDEXING AND ABSTRACTING SERVICES OFFERED BY OTHER LIBRARIES

On the other hand, indexing of scientific literature published in local journals is well covered by the National Library and libraries of tertiary institutions. Since 1973, the NL has carried out the compilation of the Singapore Periodicals Index. Local scientific literature indexed includes articles on medicines, agriculture, architecture, pure sciences and technology.

The Singapore Polytechnic Library too offers indexing services in the field of engineering, science and technology. Articles published in twelve Singapore and Malaysia periodicals are indexed using SEARS List of Subject Headings. Other materials indexed include newspaper cuttings and trade literature. Since indexes are kept in card form, they are updated only as and when required. However, the library has plan to computerize its indexing service in the near future.

In order to keep track of what is being published in Singapore and Malaysia, indexing of medical periodicals published in these two countries has been carried out for more than 20 years now. Articles about Singapore and Malaysia published either locally or overseas are indexed by the NUS Medical Library in accordance with MESH (Medical Library Subject Headings of National LIbrary of Medicince). As a result of the indexing activity, BIBLIOMED (a comprehensive bibliography of medicine and related science in Singapore and Malaysia) was published by SEAMIC in 1973. Since 1982, all the materials have been input into the NUS database (called PERIND) using the MINISIS computer system.

Between 1960 to 1981, the index to periodical articles relating to Singapore, Malaysia, Brunei and ASEAN was compiled manually in card form as on ongoing project. In May 1982, the PERIND Database was set up, with records input by the staff of the Humanitites / Social Sciences / Management Reference Department of the NUS Central Library (for humanitites and social sciences), the Medical Library (for medicine and related subjects) and Law Library (for law). PERIND presently holds over 15,000 records. An index covering the humanitites and social sciences for 1980-1982 and a supplement for 1983-1984 have since been published as a by-product of PERIND.

It should be mentioned here that the NUS Library also participates in the AIBA (Agricultural Information bank for Asia) Network and contributes to the compilation of AGRINDEX. A total of thirty-nine local periodical titles are scanned regularly for inclusion in AGRINDEX & AGRIASIA database. The scope covers agriculture and its related fields including fisheries, food and veterinary science.

The Ngee Ann Polytechnic publishes two types of accessions lists with abstracts called Current Awareness Bulletin and Ngee Ann Polytechnic Bulletin. The former highlights selected articles extracted from the current issues of periodicals received by the Library. The entries are arranged alphabetically by title under broad in-house subject headings. Abstracts are then stored in the computer. Ngee Ann Polytechnic Bulletin consists of lists of new accessions, new media resources and micro-computer software.

Other materials indexed include trade literature, newspapers cuttings, acts and subsidiary legislations, local and overseas prospectuses, standards, annual reports, maps, examination papers and syllabuses of overseas professional bodies.

4.3. PUBLISHED INDEXES AND ABSTRACTS

The enormous and ever increasing wealth of scientific and technical information published in any country and in any country and in any language is now within the easy reach of scientists and researchers. The best way to get this current and concise information is from published abstracting and indexing journals. Users prefer to use abstracting and indexing journals to keep ahead of current information. Using indexes and abstracts is a more productive method than the hit and miss approach of looking through many issues of a periodical in the hope of finding the article. With this realization, many special libraries subscribe to these invaluable reference tools

5. PROBLEMS AND POSSIBLE SOLUTIONS

5.1. LIBRARY COOPERATION AND RESOURCE SHARING

In regard to special libraries, there has been a lack of co-operation among them, especially where there is similar related subject coverage. Resources sharing would play an increasing important part among special libraries. It is not economically possible for all special libraries to duplicate each other's work especially indexing and abstracting the same subject. Another problem arises when the indexes are kept in card form and these are not accessible to external users.

In early 1982, the Reference Services Division of NL conducted an informal survey of current indexing by 94 special libraries in Singapore. Information obtained from 33 libraries which responded is now recorded in cards (Appendix 3). NL could move further by updating and publishing this information which would serve as an invaluable reference tool to special sci-tech libraries. By knowing indexing and abstracting projects available in other libraies, unneccessary duplication of work could be eliminated. Perhaps this task could be jointly undertaken by NL and the the Special Library Committee of the Library Association of Singapore (LAS).

Another solution to the problem of resource sharing is to merge libraries under the same departments. In the Primary Production Department, there are in fact three libraries covering the same subject field of fisheries. Two of them, the MFRD and Aquaculture Unit are located in the same complex and yet these units have two separate libraries. The centralization of fisheries library would reduce costs, avoid duplication of materials, save manpower and thus provide better services. Since the MFRD Library is run by a qualified staff, it is necessary for the Library of Aquaculture Unit to merge with the MFRD Library.

5.2. COMPUTERIZATION PROJECTS OF SPECIAL LIBRARIES

Librarians are all too familiar with the problem of "information explosion" and the resulting "explosion" of indexing and abstracting services. We are also aware of the tedium and time needed to plough through the sea of indexes and abstracts and other sources of data gathering information. Therefore, it is not a surprise that we turn to the computer which permits us to access information within seconds.

The Singapore Government's recent emphasis on automation has generated a keen interest in computerization among libraries in Singapore. The NUS is a step ahead in computerization of the other libraries in Singapore. They have tested and accepted the MINISIS software package developed by IDRC. This was followed by the NTI which has an automated cataloguing system and the NAP which began with an in-house circulation system, has recently adopted the URICA Turnkey System.

Special libraries have also set about computerizing their own information services, some based on use of microcomputers with in-house software packages or minicomputers shared with their parent organizations. While libraries of educational institutions computerize their loan and cataloguing system, special libraries are interested in computerized information retrieval for efficiency in locating information.

In the field of computerized reference services, SISIR is now involved in library automation as part of ITIS which provides a computerized database for its current awareness service to its users. In SIA, MFRD, DMO & NPB libraries, indexed titles are stored in the computer. On-line information from in-house databases is available in these libraries and off-line searching service is also offered to the users.

Due to the fact the most libraries computerize their library operation in isolation, and this involves the use of different types of computer hardwares and software packages, a problem of incompatibility of the computerization system arises. It is thereforefore a waste of money, time and effort as there is no linkage of the systems and resources sharing and productivity cannot be achieved. Hence, there is a need to ensure that these developments being undertaken by these individual libraries are co-ordinated.

Realizing this problem, the Ministry of Finance formed a Committee to look into the possibility of developing a national bibliographic database (which will include NL, library of educational institutions and government department libraries). Through this network, better co-operation can be achieved, so as to economise on the resources and manpower of libraries. The finding of its study and of a consultant's report together with the proposal of SCOLA (Sub-committee on Library Automation) of LAS on a national bibliographic database resulted in the formation of SILAS (Singapore Integrated Library Automated Service) in 1985. The other objectives of SILAS include the provision of associated services, facilities and products based on the bibliographic database.

In the first four years, participation in the activities of database would initially be confined to SILAS members; NL, libraries of educational institutions, government department libraries and libraries of statutory bodies. The long-term goal is to include all libraries (whether government or non-government supported) in the network by the 1990's. The Western Library Network (WLN) is used for the implementation of SILAS.

As libraries in Singapore have used different formats in computerizing their catalogues, SILAS is trying to assist them in converting these to the USMARC, which is used by SILAS.

SILAS is also advising special libraries planning to computerize their operations on the use of software packages suitable for linkage to SILAS.

In the field of on-line searches of overseas databases, SISIR provides a Question and Answer Service which is enhanced by on-line access to overseas databases proviced by Lockheed DIALOG Information Services and the SDC (System Development Cooperation Search Services) ORBIT. The NUS Library also provides similar services available to its teaching and reference staff of the University, whereas the Reference Services Division of NL acts as a referral centre for the computer-based information retrieval service provided by SISIR. The NPB also subscribes to Lockheed DIALOG and provide fee-paying searches for firms.

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14. - List of bibliographical projects and surveys completed or in progress, November 1974 - September 1975. Compiled by Quah Swee Lan. Singapore Libraries, Vol. 5, 1975, pp. 59 - 62.

15. - List of bibliographical projects and surveys completed or in progress in Singapore, October 1975 - December 1976. Compiled by Chan Luck. Singapore Libraries, Vol. 6, 1976, pp. 58 - 60.

16. - List of bibliographical projects and surveys completed or in progress in Singapore. Compiled by Chan Luck. Singapore Libraries, Vol. 7, 1977, pp 36 - 39.

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19. - List of bibliographical projects & surveys completed or in progress in Singapore, Jan - Dec 1980. Compiled by Liu Wei Ho. Singapore Libraries, Vol. 10, 1980, pp. 51 - 52.

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APPENDIX 1

SCI-TECH LIBRARIES BY CATEGORIES

LIBRARIES OF STATUTORY BODIES :

		LIBRARY SYMBOLS
1.	Civil Aviation Authority of Singapore	SAv
2.	Housing & Development Board	SHo
3.	Mass Rapid Transit Corporation	SMr
4.	National Computer Board	SCd
5.	National Productivity Board	SPr
6.	Port of Singapore Authority	SPt
7.	Science Council of Singapore	SSi
8.	Singapore Institute of Standards and Industrial Research	SId
9.	Singapore Science Centre	SSn
10.	Telecommunication Authority of Singapore	STe

LIBRARIES OF GOVERNMENT DEPARTMENTS / MINISTRIES :

1.	Agriculture Division, Primary Production Dept.(PPD)	SAg
2.	Aquaculture Unit, PPD	-
3.	Botanic Gardens	SBo
4.	Defence Materials Organization (MINDEF)	-
5.	Department of Scientific Services	SSc
6.	Fisheries Division, PPD	SFs
7.	Marine Department	SMr
8.	Marine Fisheries Research Department	SMi
9.	Pig & Poultry Research & Training Institute (PPD)	SPg
10.	Public Works Department	SPb
11.	Sembawang Field Experimental Station	SSm
12.	Singapore Command & Staff College	SCm

LIBRARIES OF NON-GOVERNMENT ORGANIZATIONS

1.	IBM Singapore	SIn
2.	International Development Research Centre	SIa
3.	Jurong Shipyard	SJr
4.	Keppel Shipyard	SKe
5.	McDermott Engineering	SMd
6.	NCR Systems Engineering Division	SNc
7.	Neptune Orient Lines	SNp
8.	Shell Eastern Petroleum	SSs
9.	Singapore Automotive Engineering	SAut
10.	Singapore Electronics & Engineering	SEi

LIBRARIES OF EDUCATIONAL INSTITUTIONS

1.	Institute of Education	SIt
2.	Institute of Systems Science, NUS	SUIn
3.	Nanyang Technology Institute	STc
4.	National University of Singapore	SU
5.	Ngee Ann Polytechnic	SNg
6.	Singapore Polytechinic	SPy
7.	Vocational and Industrial Training Board	SIu

APPENDIX 2

LIST OF BIBLIOGRAPHICAL PROJECTS ON SCIENCE AND TECHNOLOGY IN SINGAPORE (1972-1986)

1. BIBLIOMED-SM : a comprehensive bibliography of medicine and related sciences of Singapore and Malaysia. Supplement, 1976 - 1980, prepared by the National University of SIngapore. In conjunction with Universiti Malaya, Medical Library. Tokyo: Southeast Asian Medical Information Center.

2. Cancer incidence in Singapre : a bibiography, by National University of Singapre Medical Library. Singapore: published by the International Agency for Research on Cancer in conjunction with the Singapore Cancer Registry.

3. Computers : a potpourri of library materials. Singapoe: Ngee Ann Polytechnic Library, 1984. 22p.

4. Directory of medical periodicals in Southeast Asia, editor in chief : Toshinobu Suga, contributor to Malaysia Section: Tsu Ping Woodhull, contributor/to Singapore Section: Michael Cheng. Tokyo: Southeast Asia Medical Information Centre, 1980.

5. Educational technology : a select bibliography. Singapore: Ngee Ann Polytechnic Library, 1984. 12p.

6. Energy : a select list of books. Singapore: National Library, Marine Parade Branch, 1981. 12p.

7. International bibliography on gerontology : Singapore, prepared by the Medical Library, in conjunction with the Humanities / Social Science Management Reference Dept. National University of Singapore Library . Paris: International Center of Social Gerontology.

8. Needless of cure : a bibliography of acupuncture titles in the Medical and Chinese Libraries, University of Singapore, compiled by Michael Cheng, Hui Kok Wah & Han Mui Lan. Singapore: University of Singapore Library, 1976. (University of Singapore Library Bibliographical series no. 1). In English & Chinese.

9. National University of Singapore Medical Library. Writing & editing Medical papers : an annotated biography. Singapore: The Library, 1982.

10. National University of Singapore Library. A checklist of current periodicals, 1983.

11.. Orchids : a booklist. Singapore: National LIbrary, 1981, 11p.

12. Pollution : a bibliography. Singapore: Port of Singapore Authority Library, 1979. 19p.

13. Ports : a bibliography. Singapore: Port of Singapore Authority Library, 1975.

14. A preliminary list of periodicals in special libraries. Singapore: Special Libraries Committee, Library Association of Singapore, 1984.

15. Safety : a select list of references and audio visual programmes. Compiled by K. N. Teo. Singapore: Singapore Civil Service Institute Library, Readers' Service, 1984. 37p.

16. Safety at work and at home. Singapore: National Library, 1978. 29p.

17. Shipping : a bibliography. Singapore: Port of Singapore Authority Library. Singapore, 1976.

18. A select bibliography on environmental pollution. Singapore: Institute of Standards and Industrial Research, 1972.

19. Select list of titles on building collapse. Singapore: Public Work Dept. Library, 1986.

20. Singapore : MRT (Mass Rapid Transport) : a select list of newspaper articles January 1983 - January 1984. Singapore: National Library, 1984. 8p.

21. Singapore periodicals index, 1977/78. Singapore: National Library, 1980. 513p.

22. Tropical aquariums. Singapore: National Library, 1978. 7p. In English & Chinese.

23. Union catalogue of scientific & technical serials. Singapore: National Library & Singapore Institute of Standards and Industrial Research, 1977. 265p.

24. University of Singapore. Medical Library. Singapore / Malaysian serials in the health and related sciences. Singapore: Medical LIbrary, 1979. 16p.

APPENDIX 3

CURRENT INDEXING PROJECTS ON SCIENCE AND TECHNOLOGY IN SINGAPORE LIBRARIES

(date of commencement included, where available)

1. BOTANIC GARDENS LIBRARY

List of journals indexed (commencing date cannot be traced) :

- Blumea
- Bulletin Kebun Raya Indonesia
- GCC & HTJ
- Garden
- Ground Maintenance
- Horticulture
- Kew Bulletin
- Malayan Agri-Horticultural Association
- Malayan Orchid Review
- New Zealand Parks & Recreation
- Orchid Digest
- Orchid Review
- Pacific Tropical Botanical Garden Bulletin
- Park Maintenance & Ground Management
- Park Practice
- Parks
- Parks & Recreation
- Pflanzenfamilien & Pflanzenreich

List of official publications indexed :

Gardens' Bulletin
(all articles indexed, subject : taxonomy)

Press Cuttings :

Straits Times, 1978 -
Goodwood Journal, 1979 -

Subject covered : any information on trees, parks, gardens, nature reserves, water catchment areas, fauna & flora of Singapore, orchids named, VIP visits, foreign research workers.

2. HOUSING AND DEVELOPMENT BOARD LIBRARY

List of journals indexed :

Ekistics,	1961 -
Majallah Akitek	1974 -
Quantibuild	1968
SIAJ	1968
Singapore Surveyor	1976
SEA Building Materials & Equipment	1978
Surveyors Quarterly	1976
Town Planning Review	1969
Unibeam	1975/1976

Press Cuttings :

Monographs on local matters are examined for articles on public housing in Singapore.

Straits Times, 1981
New Nations, 1981 (ceased publication)

3) MARINE DEPARTMENT LIBRARY

Press Cuttings :

Straits Times, 1977
New Nations, 1977
Business Times, 1977
Sin Chew Jit Poh, 1979
Nanyang Siang Pau, 1979

Subject covered : on matters relating to Marine Dept., Registration of ships, Engagement and discharge of seamen, Deck & Engineers' examinations, Surveys of vessels, Shipping collisions & casualties involving Singapore ships.

4) NATIONAL LIBRARY, SINGAPORE

List of journals indexed :

Aircraft Engineer : Official Jnl of the Ass. of Singapore Licensed Aircraft Engineers
Annals of the Academy of Medicine, Singapore
Architecture Journal
ASEAN Journal of Clinical Sciences
Computing
Computer Era
Dental Journal
The Gardens' Bulletin
Insight : Official Publication of the Singapore Association for Mental Health
Institution of Engineers, Singapore. Journal
Journal of the Singapore Paediatric Society
Malayan Orchid Review
Maritime Asia
Maritime Voices
Mass Transit
Mimar : Architecture in development
Office Automation
PetroAsia
Petromin
Productivity Digest
Scientas
Shippers' Times
SIAJ : Journal of the Singapore Institute of Architects
Singapore Dental Journal
Singapore JOurnal of Obstetrics and Gynaeacology
Singapore Medical Journal
Singapore Scientist
Society of Naval Architects and Marine Engineers, Singapore
Southeast Asia Building Materials and Equipment
Southeast Asia Construction
Unibeam

1945

5) NATIONAL UNIVERSITY OF SINGAPORE, MEDICAL LIBRARY

List of journals indexed :

Annals of the Academy of Medicine, Singapore
ASEAN journal of clinical sciences
Asian journal of infectious diseases
Singapore Medical Journals
A classified list of periodical subscriptions in the Medical Library, 1979
A title / subject list of computer-generated searches made by the National Library of Medicine, U.S.A. and kept in the Medical Library, 1979

6) PORT OF SINGAPORE AUTHORITY LIBRARY

List of journals indexed :

Port View. v. 1, 1980
(selective indexing of shipping articles from other titles)

Official publications

Singapore government gazzette
    Bills supplement, 1977 -
    Acts supplement, 1977 -
    Subsidiary Legislation Supplement, 1977 -

Press Cuttings :

Straits Times
Business Times
Malaysia Business Times
New Nation
New Straits Times
(on shipping and port news)

Biographical information of Singaporeans :
    Persons involved in shipping and related industries

7) SINGAPORE POLYTECHNIC LIBRARY

List of journals indexed :

Engineering Jnl. of Singapore
Engineering Technicians
Institute of Engineering Singapore Journal
Journal of Singapore Institute of Architects
Planews
SEAIST Quarterly
NUS School of Architect Journal
SEA building materials and equipment
Singapore Polytechnic Engineering Journal
Singapore Polytechnic Engineering Society
Singapoe Marine Engineering Reviews
Singapore Business
Ministerial speeches
Singapore Management Review

8) TELECOMMUNICATION AUTHORITY OF SINGAPORE, TELECENTRE LIBRARY

Official publications:

Singapore government gazette, 1974
Subsidiary Legislation, 1972
Acts Supplement, 1970
Industrial Relation, 1974

Press cuttings :

Straits Times, 1975
Business Times, 1975
New Nation, 1975

Subject covered : Telecommunication industrial training & safety, Economic trends, Work of some statutory boards eg. HDB / JTC

APPENDIX 4

QUESTIONNAIRE ON THE ABSTRACTING AND INDEXING SERVICES IN SCIENCE AND TECHNOLOGY IN SINGAPORE LIBRARIES

The purpose of this questionnaire is to obtain some insight into the abstracting and indexing services in science and technology available in Singapore libraries. Please tick (✓) in the relevant boxes provided.

PART I :

1. GENERAL

a) Name of Library / Information Centre ______________________________

____

b) Address ____

c) Telephone No. ____________

d) Date established ________

e) What is the nature of your library?

Public ☐

Government ☐

Statutory Board ☐

Academic ☐

Special (Please specify)

- Commercial ☐
- Technical ☐
- Research Organisation ☐
- Others ☐

2. SOURCES OF INFORMATION

a) Size of collection

Books ☐ ______________ volumes

Periodicals ☐ ______________ titles

Microfilm/fiche ☐ ______________ items

A V Materials ☐ ______________ items

Technical Reports ☐ ______________ volumes

Others (Please specify)

____

b) Specific subject areas covered (science and technology only)

____

____

____

____

3. LIBRARY USERS

a) No. of staff and students (from within institution) ________

b) No. of staff and students (from outside institution) ________

c) Others ______________________________

4. FACILITIES AND SERVICES

a) LOAN

Loan policies (types of material loaned)

____

________ loans (approx. no per year)

________ inter-library loan (approx. no. per year)

b) REPROGRAPHIC

Microcopies ☐

Photocopies ☐

c) REFERENCE AND INFORMATION SERVICES

Current Awareness ☐

Bibliographical literature searches ☐

On-line Information Searches ☐

Selective Dissemination of Information ☐

Translation ☐

Indexing / Abstracting ☐

d) BIBLIOGRAPHIC AND DOCUMENTATION SERVICES

Bibliographies ☐

(by type of materials)

Official publications ☐

Periodicals ☐

Newspaper ☐

University Theses and Dissertations ☐

A V Materials ☐

Others (Please specify) ☐

____

Periodical Bibliography ☐
Indexes to Periodicals ☐
Library lists of Periodicals ☐

Library Directories and Holdings ☐
Guide to libraries ☐
Library Catalogue ☐
Union Catalogue ☐
Accessions Lists ☐

PART II :

INDEXING SERVICES ON SCIENCE AND TECHNOLOGY

1. Titles of Indexes (include previous title if any)
a) ______________________
b) ______________________
c) ______________________
d) ______________________

2. Subject fields covered (list subjects related to science & technology only)
a) ______________________
b) ______________________
c) ______________________
d) ______________________

3. Arrangement or classification of entries
a) Author ☐ b) Keywords ☐
c) Subject Headings ☐
State which Subjecct Heading used ______________
d) Classification scheme ☐
State which schemeused ______________

4. Periodicity of indexes
monthly ☐ bi-annual ☐ annual ☐
cumulative indexes

5. Availability
Subscription ☐ Exchange ☐ Internal use only ☐

6. Types of materials indexed

Periodicals ☐ Newspapers ☐
Conference Proceedings ☐ Pamphlets & reprints ☐
Others (Please specify) ______________________

7. Coverage of sources

Locally published materials ☐ __________ titles
Regionally published materials ☐ __________ titles
Internationally published materials ☐ __________ titles

8. Form of indexes

card indexes ☐ published indexes ☐
computerised indexes
  off-line printout ☐
  on-line access ☐
  Please specify type of computer used
  ____

9. Please name the indexing journals available in your library

Titles	Subject coverage
____________	____________
____________	____________
____________	____________
____________	____________

10. Is your library participating in the compilation of any regional index?

Yes ☐ No ☐

If yes, please specify name of the regional organization/ agency, title of index, year of publication (1st issue), name of data base if any.

____
____
____
____
____

PART III :

ABSTRACTING SERVICES IN SCIENCE AND TECHNOLOGY

1. Titles of Abstracts a) ______________________________
b) ______________________________
c) ______________________________

2. Subject fields covered (list subjects related to scinece & technology only)
a) ______________________________
b) ______________________________
c) ______________________________

3. Arrangement of classification of entries

a) Author ☐ b) Keywords ☐
c) Subject Headings ☐
State which Subject Heading used ____________________
d) Classification scheme ☐
State which scheme used ______________________________

4. Periodicity of abstracts

monthly ☐ bi-annual ☐ annual ☐
cumulative abstracts ☐

5. Availability

Subscription ☐ Exchange ☐ Internal use ☐

6. Types of materials abstracted

Periodicals ☐ Newspapers ☐
Conference Proceedings ☐ Pamphlets & reprints ☐
Others (Please specify)______________________________

&. Coverage of sources
Locally published materials ☐ ________titles
Regionally published materials ☐ _______ titles
Internationally published materials ☐ _______ titles
Others (Please specify)

____

8. Form of abstracts

card abstracts ☐ published abstracts ☐

computerised abstracts
off-line printout ☐
on-line access ☐
Please specify type of computer used

____

9. Number of abstracts / year average no. abstracts and / or references supplied yearly ______________________

10. Number of words / abstracts ______________________

Interval between primary publication and publication by the abstracting service ______________________

11. Language source covered

English Language ☐ Chinese Language ☐

Malay Language ☐ Tamil Language ☐

Other Language ☐

12. Please name the abstracting journals available in your library

Titles	Subject coverage

13. Is your library participating in the compilation of any regional abstract?

Yes ☐ No ☐

If yes, please specify name of the regional organisation / agency, title of index, year of publication (1st issue), name of data base, if any.

____

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Thank you for spending your time to complete this questionnaire.

Name and position of respondent ______________________

Date ______________________

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IFLA GENERAL CONFERENCE, TOKYO

PRE-SESSION SEMINAR TOKYO 1986

Special Libraries and their role in National Development

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PRESESSION-14-E

REGIONAL INFORMATION NETWORKS IN LATIN AMERICA: CAN THEY SURVIVE?

by

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Latin America
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Appendix 1: List of Regional information networking efforts in Latin America and the Caribbean.

Bibliography

INTRODUCTION

This paper presents some personal perceptions and thoughts about the regional information networking efforts in Latin America.

Unfortunately there are very few hard facts on networking evolution in the region. Also very little has been published on this subject by latin american authors. There certainly exists a vast amount of data scattered in different institutions in the region, but their quality ,completeness and updatedness do not make it easy to render the comparisons or aggregations that would allow a global picture.

Thus, on the whole ,the ideas presented here are based on practical experience, personal observation and discussion with my collegues at ECLAC/CLADES and those belonging to many institutions of the region that have been generous enough to share their views with me. At this point, I would like to apologize for not being able at this time to present a more empirically-based document, particularly in a country like JAPAN that has one of the finest national statistical systems in the world and where scientific rigour is the norm.

The position of a regional information adviser in a UN regional commission enables one to be in touch with networking efforts and to perceive different situations, problems and the degree of success of attempted solutions. It provides also with the possibility of comparing situations and formulate plausible explanations as hypothesis for testing in future research. Unfortunately the role of regional adviser is closer to that of a "fireman"- having to solve urgent problems on the spot-than to that of a scholar.Time constraints and a jet-speed working pace always prevent the pursuance of further enquiries or the gaining of indepth knowledge about particular situations. I am sure that many times the hidden cultural or historical roots of networking problems escape our perception .These shortcomings should the be kept in mind.

I make this presentation in the hope that it will stimulate discussions -as frank and open as possible -since my views are only my own and do not necessarily reflect those of my collegues or my organization.

1. INFORMATION NETWORKS :ARE WE TALKING ABOUT THE SAME THING?

In the ASIS Annual Review of Information Science and Technology 1975(1), the concept of information network was said to have an elusive character. I think this conceptual misunderstanding is still prevailing in Latin America.

To attempt a thorough discussion on the 'information network concept certainly falls beyond the scope of this paper. Rather, a pragmatic and admitedly simplistic approach will be followed in the hope of making clear ,at least, what our understanding about the concept is. Instead of attempting a formal definition we will order the conceptual building blocks of a definition in three groups. The first group is to be constituted by what I consider essential components. The second group by optional components and the third by concepts that act as qualifiers.

ESSENTIAL	OPTIONAL	QUALIFIERS
Organization	Common Procedures	Purpose
Inter-institutional	New Technologies	Information Content
Resource-sharing	Degree of centralization of network decisions	Information Format
Communications links	Degree of concentration of network operations	Spatial coverage
Facilitate access to information and promote its use	Charging Policies	Societal mission
		Legal nature of participating institutions

An information network is thus primarily an inter-institutional organization, that facilitates access and promotes the use of information through the application of resource sharing principles and through the operation of communications links commonly agreed upon.

Thus, an information network may or may not use commmon operational procedures although it is highly desirable that they do so taking into account their eventual connection with other networks that might operate with international standards. Also it is not essential although it is being highly desirable ,that a network utilizes modern technologies for processing and communicating data, in order to ensure greater speed and access to a larger amount of documents and data.

Interinstitutional aspects and decisions concerning resource sharing and communication links involve primarily the interaction of people.That is why I believe the prevalent concept of information network as an interconnected set of physical devises is very limited and misleading. This technological vision is inadequate for Latin American countries where, excepting a few metropolies ,the majority of population centers will have to rely for some years to come on traditional communication technologies,such as the mail and the telephone.

As an organization, a network needs resources for generating products and services to reach its objectives, and a management capacity that can pool and organize the resources so that the objectives can be met.

My analysis will be focused in one of the areas of information networking that I believe to be of the utmost importance for its future : management

In order to make a second slant on the subject, we will concentrate on the qualifiers and will ignore this time the column of concepts that we called optional.

The concepts that qualify and permit the clasiffications of networks are in my view:

* societal mission (higher education, development planning, scientific and technological development, environmental control..);
* purpose (decision making;research;design;entertainment,...)
* information content (bibliographic and bibliographic type(textual), statistical, cartographic,.);
* information format(documents, data, images,....),
* spatial coverage (intrainstitutional,national,regional, international,.);
* legal nature of component institutions (governmental, intergovernmental, non-governmental,....).

Within the framework of this discussion, the focus will be on information networks acting region-wise, dealing with bibliographic and bibliographic type(textual) information for the furtherance of development missions.

I am aware that the subject of this session is one sector of information activity: scientific and technological information. With due respect,however, I am taking the liberty of broadening the subject scope in view of the increasing awareness of latin american professionals that information should be considered more in terms of development missions instead of disciplines. Legal aspects, documentation dealing with political statements all form part of development information and are not scientific in any strict sense.

2. PATTERN AND STRUCTURE OF REGIONAL NETWORKS

There exist over 20 information networks acting region wise in Latin America and the Caribbean. Twenty two of them (22) are shown in appendix 1. 17 out of the 22 are under the leadership of regional institutions or institutions having national character that have assumed a regional coordinating role.

At least 11 of the 17 efforts are related to or framed by international endeavours such as DEVSIS, POPINS, POETRY, HABITAT,etc.

Only five out of the 22 are based in international organizations existing outside the region.

On the other hand, 14 out of the 22 are based on intergovernmental agreements while 9 out of these 14 are related or belong to programs of the United Nations.

The list does not include other regional networking efforts . Some of them are at the design stage while others are rather unknown to me in terms of their present state of development.Among these at least 8 efforts can be named. These networks would cater to the needs of users in sectors such as fisheries,forestry,mining,labour,women issues,delinquency , migration and the information sector itself.

The initial investments and operational costs of existing regional networks have not been ascertained and compared systematically, nor has their impact on their target audiences been assessed. Cost-effectiveness in information networking is a topic that would deserve closer attention by researchers and graduate students of the region. Also there is no information available on the evolution of the life cycle of these networking efforts. A casual observation permits to state, however, that all of them have experienced set-backs , and many are facing problems that are endangering their survival. A few only have followed a rather stable growth path and enjoy full recognition from the communities of users they are supposed to serve.

What are the reasons that account for these differences? What can be considered to be major success factors?

A systematic examinations of these questions would certainly deserve a long term research program. However, as a first step, it would seem worthwhile attempting an identification of the factors which exercise a higher influence on information networking performance in the region.

For this purpose it is worthwhile to look at a structure of a typical regional information network . Normally, this structure is constituted by three layers (regional coordinating institution; national coordinating institutions; national participating institutions).These layers are shown in the figure below

A "human" approach to information network analysisconsiders such arrangements as a group of people interacting with each other and assuming a variety of duties and responsibilities needed for the functioning of the whole.

Management should not only consider the individuals that happen to be in charge of networking efforts at present. Management includes also functional aspects and the degree to which these aspects have been institutionalized.

It is true that economic and political instabilities in the region, and even open conflicts in parts of it, prevent the growth of resource sharing and cooperation activities where mutual trust is a need. Lack of external financial assistance or the rapid technological rate of change sometimes cause inadequate use of the technologies and produce networks failure.

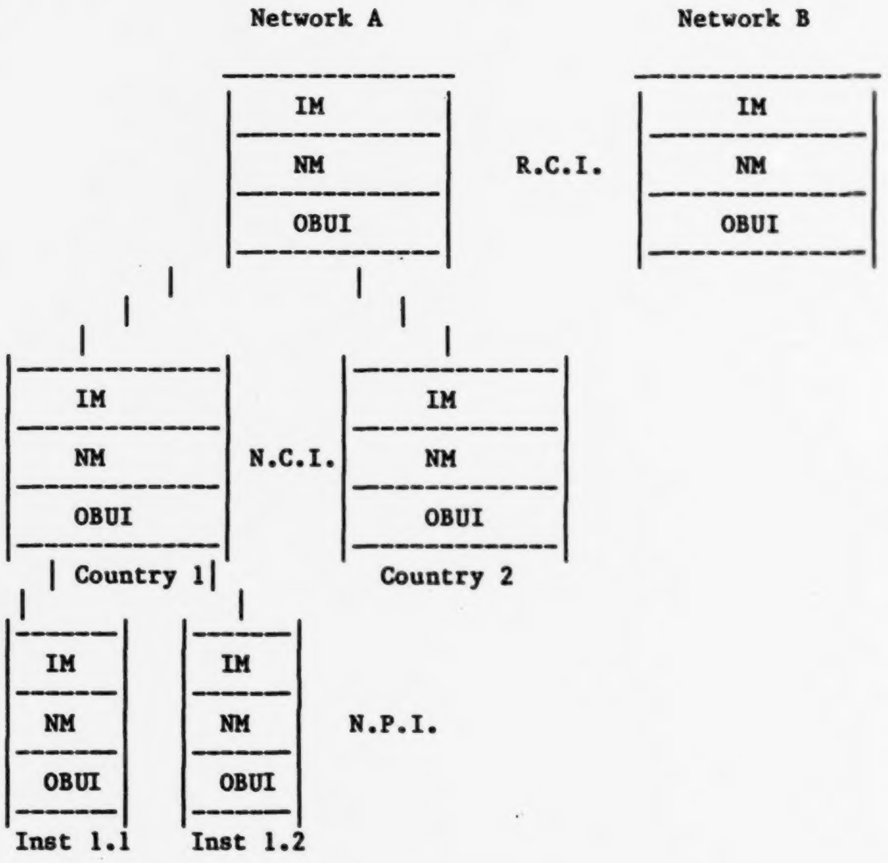
However many cases testify that good management capabilities have "discovered" financial resources where none were supposed to be available . In other cases , the search of a good technologist has minimized technological failure.

In the figure below each of the three layers are shown:

R.C.I. : Regional Coordinating Institutions
N.C.I. : National Coordinating Institutions
N.P.I. : National Participating Institutions

These in turn have been divided in three main components:

IM : Network Parent Institution Management
NM : Network Management
OBUI: Network Operational Branch and User Interphase


Network A
Network B
IM
NM
OBUI
R.C.I.
IM
NM
OBUI
IM
NM
OBUI
N.C.I.
IM
NM
OBUI
Country 1
Country 2
IM
NM
OBUI
IM
NM
OBUI
N.P.I.
Inst 1.1
Inst 1.2

Management capabilities have to be considered at the three levels suggested by the figure above.

- The regional network management

- The national network management

- The national network participant management (network liason functions)

A first hypothesis that I would like to put forward for testing is that network managerial capabilities is a variable that has the highest significance in network success and performance.
If all the conditions that according to the literature are required for effective information network management were ever listed we would soon end up searching for mythical men or women or imaginary institutions to take up these responsibilities.

However ,we have taken an option in order to avoid transforming this paper into a book. if the conditions for effective management were grouped ,one of the groups will certainly be called "outreachness" capability.

Outreachness is also a rather elusive concept. Anyway, in our mind, it should include an attitude for learning more about the world in which a network is inserted and undertake actions to make the outside world more hospitable to network growth.

This outreachness capacity will in turn be analized according to three levels we have selected for the sake of shortness.

Level 1:Interaction of network management with the operational barnch and user interphases.

Level 2:Interaction of network management with akin capabilities existing in other networking institutions

Level 3:Interaction of network managers with the management of the parent-institutions.

At this stage we pose a second hypothesis: the impact on network performance is greater as we move from level 1 to level 3.

3. TRAPS IN LATINAMERICAN NETWORKING

3.1 Deffective links with operational & users components of an information network

The immediate and most obvious task for an information network manager is to "run" his/her bussiness well.

In this area some of the problems frequently detected in Latin American information networks are:

a. Difficulties in interacting with technological services of the parent organization

Very few information network managers has a strong technological background. This has created favourable conditions for conflicts and problems.New information technologies have not been in general well controlled in some networks .Priority setting has not been an easy task when the network has had to rely on the central computer facilities of the parent institution. Moreover few network coordinating units have been endowed with technologist under the supervision of the network manager .This situation might have facilitated an application of new technologies according to the network policies and priorities.

b. Absence of network services and product evaluations by users.

This is an activity that is seldom found as a permanent component of network work-programmes. Only isolated enquiries have been detected with little or no follow-up. This has created a situation in which very few network managers know today what is the reception, utilization or simply the suggestions the users would be willing to make about their services.

c. Obstacles to the flow of information for adequate network decision making

It has been observed in some cases that managers have tended to concentrate too many responsibilities and information in his/her own hands. Information about what is going on inside the network and in the world surrounding the network, has flown with difficulty or undue delay among the members of the coordinating unit group.

3.2 Deffective links with peers fulfilling akin functions

This is an area which is very seldom considered to be a part of the responsibilities of a network manager or to have any value for the performance of his/her functions.So far I have never encountered a reference about this requirement in managers job descriptions.

Here is where the outreachness syndrome is more likely to be manifest. Some of the problems that are indicators of this lack are:

a.Scarce interchange of experiences among network managers.

There are very few formal information flows between network managers. Networks managers usually do not include one another in distribution lists. They seldom are aware of other networks activities nor do they participate in training opportunities or share the visit of experts promoted by other networks.Very rarely the fact of getting closer is considered to be mutually beneficial involving costs not greater than that of a letter or a telephone call. Regional efforts to enhance the communications links between networks are badly needed.

b. Lack of demand for peer evaluation

This is an attitude rather generalized in many professions in Latin America. It appears to have been originated very early in the educational process, which in itself is non-critical and non-participative. Very few people ask for opinions or are willing to accept them. Criticism is likely to be taken as a questioning of personal competence irrespective of the form it is made .

c. Subutilization of invisible colleges and personnal networks.

Network managers are sometimes reluctant to participate in professional associations meetings or to keep invisible colleges. Sometimes there is an attitude of disregarding any contact with other members of the information profession, whose potential contribution is perhaps not considered relevant. However, the irradiation or multiplicative effects of these contacts cannot be disregarded.

The pre-existence of active informal networks among proffessionals is a real asset for starting networking capabilities. The networking efforts in the Caribbean have been greatly facilitated by the continuing working of ACURIL and other forums.

When all the above problems are coupled in varying degrees, it is not surprising that network activities are very little known, or that sometimes unjust criticism is made just because there is a lack of information about what the network is doing or attempting to do.

3.3 Deffective articulation with the parent institution management

This conforms an area of problems that are pervasive in the region.

Three problems have been selected as the most frequent ones.

a.Weak innovative capabilities

Networks need to adapt - as anyother organization- to the changing and often adverse conditions of the environment.

To tackle the adaptation problems solutions should be designed and presented for approval to the parent-institution administration. However, oral or written communications problems ; difficulties to prepare projects to external funding agencies when internal funds are shrinking or not available; lack of knowledge about techniques to market not only the products or services but the network as a whole, are all difficulties that are prevalent in many information networks.

These shortcomings do not relate to the ability to work-out sound solutions ,but to the ability to implement the solutions themselves.

b. The evaluation syndrome

It is a fact that very few formal information network evaluation exercises have been carried out in the region and related documentation is practically non-existent in Latin America.

This situation certainly prevents the networks from learning from past mistakes and properly adjusting for the future .

Here not only the information network managers are responsible for this situation but also the parent institution management share its part by not asking that periodic evaluation be carried out about the networks they have decide to house. It is not clear whether this later attitude is due to lack of interest or avoidance of a topic which they might be non-familiar with.

My feeling is that the absence of global network evaluations will be gradually overcome when network managers are convinced that they are not unique in running a network that has not met [illegible] goals, and that problems occur even in experienced and well [illegible] institutions in developed countries. Also evaluations [illegible] began to be requested by network managers themselves when [illegible] feature becomes culturally recognized as a professional excellence feature in Latin America.

c. Navigators without a compass.

Information systems in support of information network management is an area that badly need development and greater understading in the region. The lack of sensors or statiscal indicators about network functioning and performance; the lack of historical records and organized document collections on network development, and insufficient knowledge about the network environment all create unfavourable conditions for effective decision-making.

There have been many cases where information network have been discontinued or are or about to die , because the parent institution management did not really grasp the importance of the network, or considered the network as high priority project of his/her organization.

Insufficient knowledge about costs is another sensor area that needs particular attention.

Very rarely one finds cost studies in information networking.

This imply that very few managers are in a position to quote offhand the cost of producing a bulletin, the cost of a data base search,etc.

It is true that frequently many cost components are managed by departments other than the one in charge of the information network. Nor does the information network manager ,and what is worse, the management of the parent institution seem to require this information for decision-making.

This lack of articulation with top level management cannot be solved by expecting spectacular change from the parent institution management .

This is perhaps the biggest issue affecting information network survival in the region.

SOME WAY OUTS AND CONCLUSIONS

Irrespective of what has been said I am fully sympathetic with the very hard , complex and usually not well understood task that information network managers are carrying out in Latin America.

Nobody that I know of, in Latin America, has been "trained" to perform as an information network manager. Information networking is still relatively new in the region and is far from being a mature activity.

Networking is facing many external and internal problems. The debt burden of the majority of latin american countries has meant budget cuts, and increased preassures to produce more or generate quick results with less resources ,ignoring the hardships of knitting cobwebs across national boundaries.

The problems are certainly not affecting all the networks equally and also very positive attainments can be registered in almost any network. Sometimes the mere fact of convening people from different countries and getting a network launched can be considered almost a miracle.

However it would not have been appropiate if I had tried to depict a glossy and pink image of regional networking and its management component in particular.

At this stage I can conceive of two proposals as initial way outs to these problems:

1. In-service training for network managers at the more experienced institutions leading networks in the regions or other third world regions.

2. Airing of the mentioned problems in professional associations appears to be a great need also. I believe IFLA/Lac can fulfill a very important role in creating conciense of these

problems and in promoting regional or national projects or activities as an answer to these urgent needs.

Caracas, 1986

APPENDIX 1. LIST OF REGIONAL INFORMATION NETWORKING EFFORTS IN LATINAMERICA

Coordinating Institution	Societal Mission	Name of Network	Spatial Coverage
I. Regional Inter-gov.	Agriculture	AGRINTER	LAC(*)
	Children Lit.	PILI	LAC
	Dev.Planning	INFOPLAN	LAC
	Dev.Planning	CARISPLAN	C
	Foreign Trade	RELIC	LAC
	Health	LILACS	LAC
	Energy	SIELA	LAC
	Public Adm.	Red CLAD	LAC
	Sanit.Engineer.	REPIDISCA	LAC
	Science & Tech.	CARSTIN	C
	Technology Dev.	RITLA	LA
	Technology Mang.	SAIT	LA(Andean)
	Telecommunicat.	SAITEL	LA(Andean)
II. Regional Non-Gov.	Develop.Bank.	RIALIDE	LAC
	Education	REDUC	LAC
	Human Settles.	LATINAH	LAC
	Population	DOCPAL	LAC
III. Intern. Inter-Gov.	Agric.Research	CARIS	LAC component
	Environment	INFOTERRA	LAC component
	Nuclear Dev.	INIS	LAC component
	Tech.Cooper.	INRES	LAC component
IV. Intern. Non-Gov.	Dev. Sciences	INTERDOC	LAC component

(*) LA: Latin America   C: The Caribbean

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IFLA
1986

PRE-SESSION SEMINAR TOKYO 1986

Special Libraries and their role in National Development

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PRESESSION-15-E

Information Analysis Work and its Implications for Dissemination and Documentation of Scientific and Technical Information

by

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Keyword(s)
Agricultural Information Network
Agricultural Liaison Officer
Pacific Information Centre
University of the South Pacific

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INFORMATION ANALYSIS WORK AND ITS IMPLICATIONS FOR DISSEMINATION AND DOCUMENTATION OF SCIENTIFIC AND TECHNICAL INFORMATION

by

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INTRODUCTION

This is a large topic and covers a wide range of materials. It is necessary, therefore, that I focus this paper particularly on the South Pacific region where I come from. I will draw examples from the eleven small island states that the institution I work for, the University of the South Pacific (USP) serves, namely Cook Islands, Fiji, Kiribati, Nauru, Niue, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Western Samoa.

The South Pacific Region consists of 10,000 islands with an area of 67 square kilometres more than 98% of which is water. It has a population of 4.5 million people, twenty two political entities in various stages of political independence and dependence and no language common to all. Most of these islands have similar problems, and solutions to solving these vary from one country to another depending on the geographic, climatic, economic, social and political conditions of each island. Each country has its own language with English as the second language common to all but only about 40% of the population can speak it. These islands, except for the phosphate island of Nauru, depend mainly on agriculture as the major source of income. These islands are isolated by many miles of ocean and this makes communications and contact difficult because of high regional travel and telecommunication costs.

I am sure you can now see the many problems associated with this set-up before I even try to pin point them. I am very glad, then, that I have been given the opportunity to speak on this topic because through you I am able to highlight and market the developments and problems of information analysis work in our region. I am very privileged to be here today and to share with you discussions on various issues of interest to us all.

I believe many of you have not set foot in the South Pacific. All I can tell you before you come, is to be prepared to slow down, you will be free from traffic jams.

THE UNIVERSITY OF THE SOUTH PACIFIC

The University of the South Pacific (USP) has two campuses, the bigger one in Fiji which houses three schools: the School of Humanities, the School of Social and Economic Development and the School of Pure and Applied Sciences; and the smaller one in Western Samoa : the School of Agriculture. Our main library is in Fiji and the branch agricultural library in Western Samoa of which I am librarian in-charge. The University has an extension centre in each of the eleven countries it serves. These centres have small extension libraries to service continuing education and extension studies. Extension students number about 3500 and full time on-campus students number 2600 (Suva Campus) and 150 (Alafua Campus).

THE REGION'S NEED FOR INFORMATION

The backbone of the economy of these islands is agriculture. To develop this industry in a manner that is profitable, socially desirable and environmentally sound, the islands must have access to information and appropriate technology for agricultural development. It is therefore, very important to provide useful and relevant information on science, agriculture and appropriate technology for the development of these islands.

A number of surveys on agriculture and technological information needs of the South Pacific region have been carried out in the past. Dr W J A Payne's study in 1979, The agriculture research requirements of the countries contributing to the University of the South Pacific System recommended the development of a regional agricultural information service through a network of national agricultural agencies inputting their records to the regional centre. He also suggested the use of satellite communication for a question and answer service on agricultural matters. This in fact has now been activated under the title, Agriculture Information Network (AIN), supported by USP and IRETA. This is now strengthened by the appointments of ALOs in each island of the USP region. Ward, of Asian Development Bank in his 1979 survey emphasized the need to improve access to better information on marketing, fisheries, agriculture, forestry, livestock, transportation and statistics and he recommended that more reliable data collecting, recording and disseminating systems be established. The report recommended that the solution to this problem and other major regional problems would have to go beyond the resources of any one country and be solved on a regional basis with practical assistance coming from outside the region. I am happy to say that we are now involved with AGRIS, CARIS (to name only a few) and other overseas databases in sharing information.

Professor T M Morrisoon in his 1981 evaluation of the USP's School of Agriculture Alafua, Western Samoa recommended that increased funds were urgently required to improve agricultural resources. I am happy to say at this point that many aid donors since then have been helping us financially like USAID, CGA, CFTC, EEC, etc. Our computer searches are done free in Australia and New Zealand; a great financial help to us.

More recently, in a report on the Fisheries research needs in the South Pacific (1986) by Semisi Fakahau and Dr M Shepherd, prominent reference was made to the need for improving fisheries information services in the region. Among the recommendations to improve identify, collect, record and disseminate information on fisheries was the need to review regularly material collected by the Pacific Information Centre of the USP and also other libraries specializing in fisheries with the objective of identifying literature of particular relevance to current island fisheries management and development programmes. The report also emphasized that dissemination of written material alone would not solve regional information needs but regular personal contacts would be highly desirable.

PROBLEMS OF ACCESS TO INFORMATION

There is a wide range of problems faced by information people in the region in their efforts to supply scientific and technological information to the users. The most critical is the financial one. Agricultural, scientific and technological periodicals are becoming expensive and we do not have the money to buy all the relevant titles. We need a lot more appropriate books to fill our shelves. We work with very limited budgets and our institution selectively chooses publications which the budget can afford. The growth of on-line databases in developed countries could help us a lot in retrieving relevant information for our use, but the high telecommunication costs make access to these sources difficult if not impossible. Financial constraints also results in shortage of trained high-level manpower and this is providing a major constraint on economic development in the South Pacific. Qualified information officers are needed in sufficient numbers to staff and manage department libraries. We also have a problem in achieving adequate representation in most international information meetings and organizations, let alone in being able to affilitate with them because we cannot afford the subscriptions and attendance at meetings costs required.

Access is also difficult because often an officer will not know what is in his own department, let alone relevant publications from other departments and countries, and this is repeated on a national scale. There is a lack of trained information officers/librarians to organize, identify and locate these publications and document them correctly so they can be readily available to the users. Often the problem starts from the top administrators in their own ignorance to see the important role organized information can help in their work. There are many expatriates who come to do important research in the region. Governments, however, do not have tight policies to ensure that these researchers deposit their completed research work and reports in the host ministry or a depository information centre. In specialized subject fields some expatriate workers and extra-regional organizations have larger collections of publications relating to the South Pacific islands than exist in the countries themselves.

We have difficulty in having access to confidential reports of governments and private bodies. As high as 85% of reports in the South Pacific are unpublished and are very difficult to access. Many of these primary documents need to be collected or listed somewhere. Also these documents, when printed, are not distributed widely within the region or abroad because of limited print runs, due to lack of funds, etc. Also bibliographic data for these documents have to be organized in acceptable international format to be accepted by overseas databases. Standardized methods for documenting and distributing are, therefore, basic to improving the accessibility and reliability of these publications. Most publication collecting activities are concentrated in limited areas and are not coordinated among libraries, research institutions and information offices in the region. English documents have to be translated into local languages before rural farmers can use them. Although computers are coming to salvage us from our disability in locating information, our region still lags behind because of financial problems and lack of trained personnel in the information field. As the volume of work increases we need to devise systems and networks to cope with this increase in an efficient way.

INFORMATION ANALYSIS

INFORMATION ANALYSIS WORK CAN BE LOOKED AT FROM TWO LEVELS:

(1) The analysis involved in identifying bibliographic details, subject analysis and reconstructing these elements into universally acceptable standardized formats which can then be input, organized and disseminated and retrieved via abstracting and indexing services or information databases.

(2) Or from a more general view point where the whole spectrum of information available is analyzed and grouped into more specialzied areas and made available to provide with ease to those who need it.

Both levels overlap, interrelate, lead off from each other and re-merge, so that my purpose in dividing it as such is to accommodate the examples which illustrate various developments and their accompanying problems occurring in the South Pacific region.

Disseminating information efficiently requires much creativity and adaptability, especially in the South Pacific, where the vast majority of the end users are rural poor, mostly illiterate people. Traditional methods, based on printed materials are not sufficient. New methods have to be devised, taking into account language, culture and social factors which vary considerably from place to place. Dissemination must also be given its fullest meaning, not simply to have a piece of information physically present in many locations, but to see that this piece of information can be usefully utilized at the locations it reaches. This implies that information must reach the end-user in a form enabling him to make something productive of it.

Librarians and Information Officers have to realize they must reorganize themselves in a better way to re-organize information so they can be readily accessible to the users. The patrons are becoming educated and are asking very technical questions and librarians need to be subject specialists to be able to analyze and interpret some of these queries to satisfy the patrons. Compilation of bibliographies must be up to date. Current awareness services must be up-to-date to inform the users of new developments which they can use. Networking of different information centres and people involved in information must be encouraged.

In the region there are organizations seriously involved in the collecting, recording and disseminating of information in all subject areas. These include USP Library, Pacific Information Centre (PIC) , South Pacific Bureau for Economic Cooperation (SPEC), South Pacific Commission (SPC) in New Caledonia, and the Institute of Research, Extension and Training in Agriculture (IRETA) in Western Samoa.

WHAT IS BEING DONE

The Pacific Information Centre (PIC)

One of the regional institutions that has been active in the documenting and disseminating of scientific and technical information in the South Pacific and for use by those institutions abroad that direct requests to it is the Pacific Information Centre (PIC) which is housed in the USP library in Suva. PIC has focal points in eight islands namely Cook Islands, Fiji, Kiribati, New Caledonia, Solomon Islands, Tonga and Tuvalu. One of the important responsibilities of the focal points is to collect any local publication in their respective island, send these to the main centre in Suva where these are catalogued, classified, recorded and filed so they can be made accessible to the users. PIC also compiles bibliographies and distributes these to focal points and other information centres. PIC also puts out quarterly newsletters which informs the region of its activities and other publications it puts out. PIC also conducts training for information officers to make them knowledgeable of how library work can help in organizing information so they can be easily accessible to the users. PIC will be conducting in November,1986 a translation techniques training workshop for its focal points and other information officers as this is seen as fulfilling some of the analysis and information work necessary and part of its activities. A good percentage of publications about and on the South Pacific is in French and other foreign and local languages. The translation of important and relevant information from English to other local languages is an important service.

PIC's database is multidisciplinary and it is accessible and available to all who may wish to use it. 12,000 items are added to it each year (the library is not computerized and about 80% of cataloguing is original) with almost 40% being material originating in the region.

INSTITUTE FOR RESEARCH, EXTENSION AND TRAINING IN AGRICULTURE (IRETA)

The main function of this body is to try and bridge the gap between research and extension. Often research results never reach the rural farmers. Even if it gets out, many farmers do not understand it because it is too technical and lengthy. In trying to bridge this gap IRETA has Agriculture Liaison Officers (ALOs) in each island. The responsibilities of the ALOs are various. They regularly visit the national agriculture departments and also the farmers and find out their information problems and try to assist them. They also have regular contacts with PIC.

Reversibly, the ALOs collect from the researchers and sometimes farmers useful primary documents that can be further published properly and sent to IRETA at Alafua in Western Samoa. IRETA inputs this bibliographical information into the local database in the SOA library for the users. To make information more meaningful to the users IRETA publishes Agro-Facts - an irregular publication that informs the users of new researches and their results. ALOs distribute these and help interpret these for the users. IRETA also publishes the monthly "IRETA Agricultural Newsletter" which informs users of on-going researches; simplifies results of past researches that are still valid and puts out a question and answer column on various agricultural subjects. This activity is very useful. IRETA also brings ALOs together twice annually and conducts training for them in collecting documents, report writing and public relation work. IRETA works together with the School of Agriculture at Alafua in publishing the Alafua Agricultural Bulletin which includes all agricultural research work in the region. The Education Department of USP Alafua campus also publishes the quarterly South Pacific Agriculture Teacher which simplifies agricultural information for students at elementary level in the region. The ALO network also uses the satellite for general and specialized consultations. Telex is often used at high costs as the mail service is not efficient.

SOUTH PACIFIC BUREAU FOR ECONOMIC COOPERATION (SPEC)

This regional body is located in Suva, Fiji. It deals with many aspects of the economic development of the South Pacific Region. The publication, the SPEC series on Trade and Investment in the South Pacific aims to assist the flow of trade, investment, technology and expertise in order to achieve their development objectives. Because there is no qualified librarian/information officer in SPEC, information analysis work, collecting, recording and dissemination of trade and related information is almost non-existent. Consultancy work continues but the more active function of getting information to those who may need it - traders, business man, technician, etc. - suffers a great deal.

SOUTH PACIFIC COMMISSION (SPC)

This organization concentrates on the collection, organization and dissemination of agriculture, fisheries and information on appropriate technology. It undertakes many researches in these fields and publishes results and distributes them widely in the SPC region. Expert advice is available to the region through the expertise attached to SPC. However, little analyzing or interpreting of information is done by the libraries.

UNIVERSITY OF THE SOUTH PACIFIC (USP) LIBRARY

The USP's main library in Suva and the agricultural library in Western Samoa work very closely together in all aspects. There are 13 qualified librarians in various fields. However, this number is not enough to serve the population of the USP region who need library/information services. USP libraries put out quarterly listing of new materials already received and processed to other departments, USP centre libraries and individuals of the region. Patrons who wish to use some of these publications can get them by requesting through Inter-Library Loan from Suva or Alafua. Alafua Library has computerized its records using Inmagic software on an IBM-XT. However, the rest of the USP region cannot have access online to this database because of the lack of a telecommunication network. Patrons, however, can request computer searches by telex, satellite or mail and results have to be airmailed to them. The main library in Suva plans to computerize soon and hope all the other island nations with micros can be able to link into it. The USP Library has been active in recruiting para-professions from all over the region for short attachments to improve their knowledge on information work. It also conducts library courses for a Certificate in Librarianship for para-professionals. USP library also compiles bibliographies in special subject areas as requested by other overseas organizations and our regional patrons. USP Library works closely with libraries in New Zealand, Australia and Hawaii in co-operate acquisitions, interlibrary loans and computer searches services.

THE IMPLICATIONS OF INFORMATION ANALYSIS WORK

In information analysis work the implications for dissemination and documentation of scientific and technical information are many. To be able to be involved effectively, this implies a number of things . These considerations include:

1. The need for appropriate training
2. The availability of cheap and useable technology for information transfer and processing
3. The need for adequate funds to meet the costs of not only acquisitions of publications but also the production of various forms of communication best suited for various categories of users

4. the desirability to work and communicate more closely with various people involved in the information production, processing and dissemination process - librarian, information officers, extension officers, researchers, government officers.

All these would, no doubt, imply improvements in:

1. Planning - national and regional
2. Economic development of countries
3. Educating the masses in various specialised activities particularly in agriculture and other developmental areas
4. Extending the role of the librarian/information officers as community worker, specialist, etc.

Training

This is the most important aspect in order to improve information analysis work in our developing islands. We lack qualified librarians and information officers who would organize, translate, simplify and repackage useful information to make it available to our users. Many local publications do not reach overseas databases where they can be catalogued and classified by qualified staff. These will have to be catalogued locally, by qualified personnel which we lack and thus slows down the availability of these useful materials to the region. Many departmental collections are not organized because there are no trained people to do this work. The USP libraries follow the AACR2 cataloguing and the Library of Congress Classification systems - qualified librarians have to do this task. We do not have access yet to online cataloguing databases like OCLC; therefore the majority of cataloguing work is original. USP Library also catalogues and classifies materials for the USP centres in the centre libraries because the people looking after these centres are not capable in doing this work.

Because bulk of the time is spent on this activity there is little time available to do full analysis work as I think necessary. Furthermore, to be able to do analysis work effectively it is important that appropriate training is available and also undertaken by our people. While we recognize the importance of information analysis work there are other priority work to be done. However, if requested the USP Library, PIC, Alafua, IRETA have always tried to help our users when necessary and if we have the time.

APPROPRIATE AND CHEAP TECHNOLOGIES

This process is very vital for the South Pacific region. Although new and productive technology are available in the market many users in our region cannot afford to buy them. If they can afford it, the technology may not be appropriate for the islands because bulk of the technology was developed for the developed countries whose needs are different from those of the South Pacific region. We have experienced a lot of this incidence in the islands, where ploughs, tractors, harvesters, etc. breakdown in the fields because most islands are volcanic and therefore have stony and rough terrain that the equipment given or purchased does not last. Similarly for computers there is a danger that these will not last long in the islands because of the high humidity and heat - these machines are made overseas to suit the cold climates and conditions.

Air-conditioning the rooms to store these can become an expensive exercise particularly if we consider breakdowns, lack of spare parts and poor servicing. My over-view of this important aspect then, is for trained specialists to choose and test new technologies locally to make sure it works and is affordable by the users, before this information can be repackaged and made available to the users.

New technologies, especially computers ,are making life for librarians a lot easier. However, in our region we do not have enough trained people to handle these. The Alafua Library that I work in has an IBM-XT and uses the Inmagic software. I find I still need the services of a consultant when major problems arise. The majority of librarians and information officers in the region are computer illiterate and there is a great need for training in this area. Many still have the impression that computers cannot replace good quality but this is not true. Computer awareness training and its use are necessary if we are to take advantage of the new technologies available to improve information dissemination and documentation and make this information available to as many users as possible.

COMMUNICATION

It is clear that if we wish to improve dissemination of information analysis work there needs to be:

1. direct contact between specialists
2. contact between specialists and information officers
3. contact between information officers and the agricultural, trade, fisheries, etc. officer

4. contact between these officers and those in the field or users

The continuous and effective contact between the different interest groups is advantageous for 'us' as information scientists and 'them' the information users.

CONCLUSIONS

The overall implications of information analysis work in the South Pacific region will include the

(a) need to purchase more materials, locally and overseas

(b) need to train staff so they can do the necessary and specialised work

(c) need to conduct national and regional workshops on information work at all levels

(d) need to build and strengthen existing infrastructures which support information networks.

(e) need to purchase new technologies such as computers and other necessary library equipment to assist in information transfer, document suypply and fast information dissemination.

To do all these we need funds, good planning, better communication with top administrators in governments and hard work.

Users are becoming more educated and they are asking more technical questions. To satisfy them, libraries and information officers need qualified subject specialists, who will interpret and analyse information for these users. On the other hand, since the majority of users are illiterate information must be repackaged, made simpler, short, attractive, easy to read and understandable in the languages of the users. This implies that a lot more work must be done at a shorter time by information officers if they are to satisfy the users' needs for current, cheap and appropriate information that can be used productively by the users.

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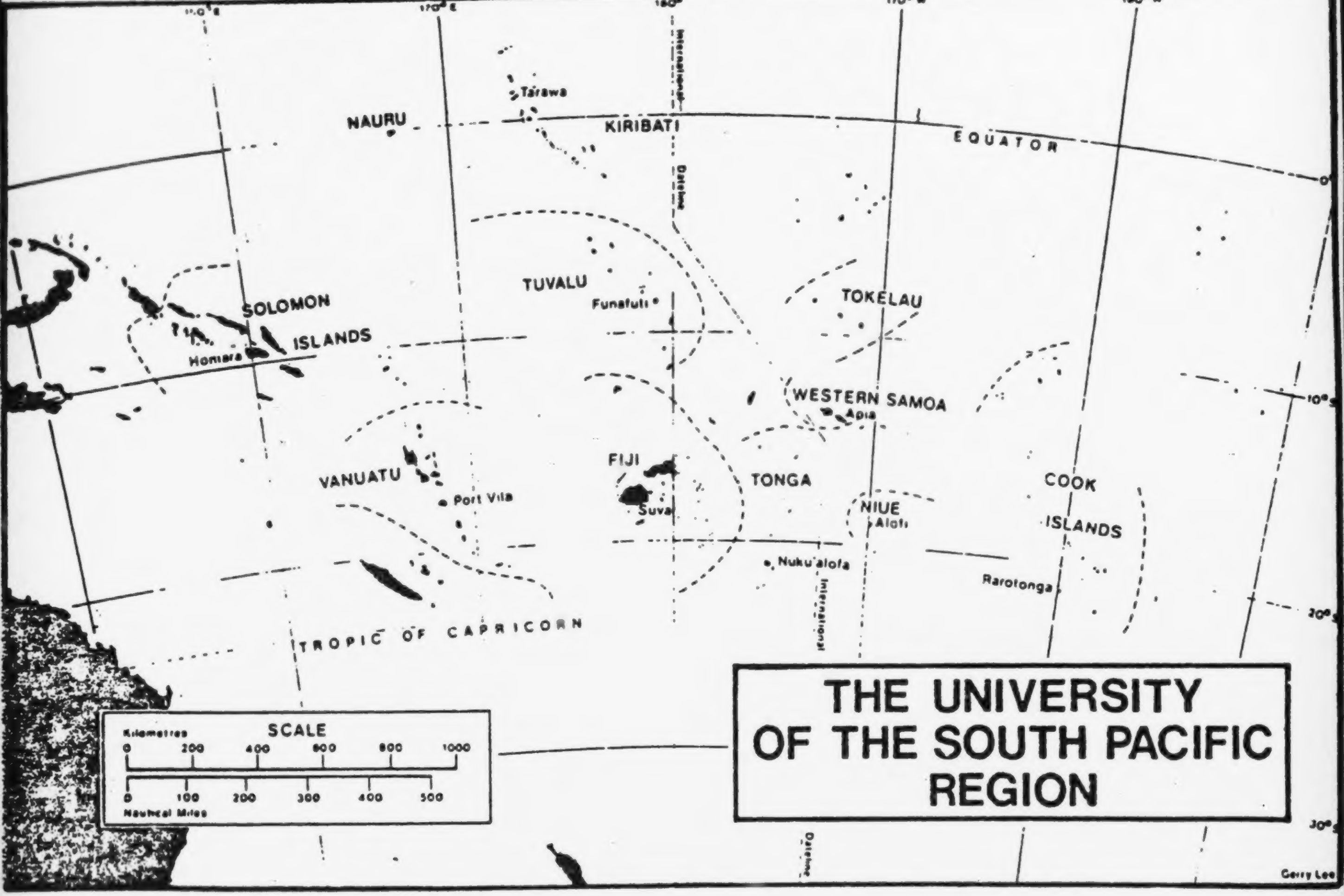
THE UNIVERSITY OF THE SOUTH PACIFIC REGION

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NAURU
KIRIBATI
EQUATOR
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International Dateline
TUVALU
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WESTERN SAMOA
Apia
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FIJI
Suva
TONGA
VANUATU
Port Vila
NIUE
Alofi
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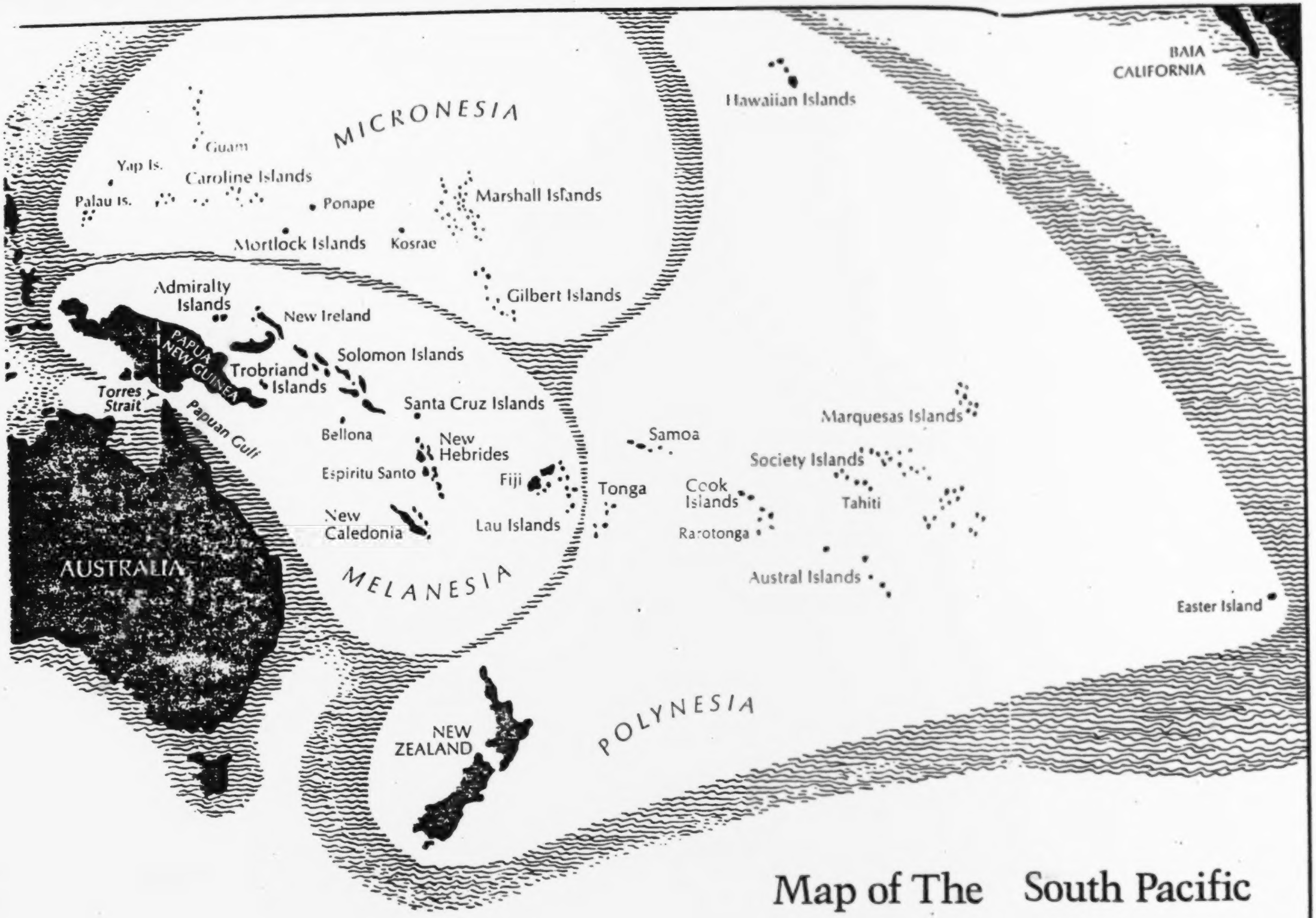
Nautical Miles
Gerry Lee

SOURCE : USP CALENDAR 1985


MICRONESIA
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Mortlock Islands
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Gilbert Islands
Hawaiian Islands
BAJA CALIFORNIA
Admiralty Islands
New Ireland
PAPUA NEW GUINEA
Solomon Islands
Trobriand Islands
Torres Strait
Papuan Gulf
Santa Cruz Islands
Bellona
New Hebrides
Espiritu Santo
Fiji
Samoa
Tonga
Cook Islands
Rarotonga
Marquesas Islands
Society Islands
Tahiti
Austral Islands
Easter Island
New Caledonia
Lau Islands
AUSTRALIA
MELANESIA
NEW ZEALAND
POLYNESIA

Map of The South Pacific

SOURCE : Price, Christine
Made in the South Pacific

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Special Libraries and their role in National Development

1986

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PRESESSION-17-E

INFORMATION FOR DEVELOPMENT, CONCEPTS AND RESOURCES

by

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1. FEATURES OF RECENT ASIAN SCENE

Before I discuss the topics on which I am assigned to contribute, I would like to take a look at the two features which constitute an important background of the recent information scene in Asian nations. The first is the trends of recent development of national economies, and the second is the "information explosion" within the region.

It is forty years since the end of World War II, and despite continued efforts for development during these four decades, poverty, scarcity, starvation, and misery are still prevailing over the third world. However, we find some of the developing countries are now passing through the development stage of so-called "take-off," and others are following them one after another 1/. These emerging developping countries are mainly concentrated in East and Southeast Asian region (Table 1). This continued economic growth makes development activities more diversified and complicated, and as a consequence it makes the needs for information more sophisticated qualitataively and quantitatively.

The second feature I would like to mention is a strong intention towards the "information oriented society" and "information explosion" within the region. The term "information explosion" expresses an exponential growth of the production of information in industrialized countries, but a similar phenomenon has been recently observed also in Asia. The Institute to which the present reporter belongs has recently carried out a survey on the production and distribution of scientific and technological information under the contract with the Science and Technology Agency of Japan. In the survey, we included three Asian countries in our sampling frame. The findings which are pertinent to this paper are:

(1) The output of the recorded information in science and technology in the world during the years 1972-82 is estimated to have grown from 2.30 million volumes per year to 3.24 million. This is a 41 percent growth in a decade (Tables 2-5, Figure 1-2). The growth was larger in the years 1977-82 than those in 1972-77.

These growth of information generation could be interpreted due to the result of research and development efforts on new energy development and energy saving technology that were enhanced during the two oil crises. Further, research efforts in new fields like electro-technology and bio-science push acceleration of production of information.

(2) Growth of the generation of information in science and technology has occurred in some of the developing countries. According to our estimation, the volume of

the generated information in science and technology during the years 1972-82 was 6.3 times in the Republic of Korea, 4.3 times in Indonesia, and 1.5 times in Thailand. We did not include those information on business, economics, and social sciences into the estimation. Therefore, the volume of information in total would be much larger than these figures show. I suppose that in other Asian countries the same trends would be true.

Against these backgrounds, the needs for information in Asian developing countries give rise to new tasks and missions to those who are working in the professions related to the production and dissemination of information.

2. DEFINITION OF INFORMATION

Information was used to be recognized as playing only a supplementary and supportive role in the past development activities. However, it is being increasingly recognized as an important resource and tool for various aspects of contemporary development activities.

Here, "information" is defined as a message expressing facts, state of things and concepts--a meaning different from "knowledge." Yukichi Fukuzawa, philosopher and educator who introduced Western thinking and education systems into Japan in 1870s, had already been aware of the difference between knowledge and information. He wrote in 1880 as follows:

> "The word of knowledge should be understood to mean not only to think out things in accordance with their nature, but also to know the state of things as they are. The latter might be equal to the meaning of the word of information in the English language." 2/

Today, there exist a bundle of definitions of the word "information". We will find, for example, five definitions of information in the UNESCO's Terminology of Documentation. Here I prefer to select the most simple definition, that is, "facts being communicated" or "facts and concepts being communicated" 3/.

Information, defined as such, includes a variety of data, records and concepts, ranging from simple numerical data to machine-readable data files. If we classify these kinds of information in correlation with the degree of enhancement of information and with the distance of generation point, we will have five categories (Figure 3).

Category I: Numerical data
Statistics
First-hand results of questionnaires
Hearing notes
Internal memorandum, etc.

Category II: Newspapers
Radio and TV broadcastings
Internal documents, etc.

Category III: All recorded primary documents as:
  Books
  Journals
  Technical reports
  Other unpublished printed materials, etc.

Category IV: All secondary information as:
  Indexes
  Abstracts, etc.

Category V: Bibliographic databases
and search results

Of those categories of information, librarians mainly touch and process those in the categories III, IV, and V, that is, all recorded primary information, mainly in the form of printed documents, and the secondary documents, based on the former. Machine-readable bibliographic databases are recently reinforcing their service "menu."

Then, what is a special library? Here I define it as the library which is primarily serving a specific category of users through providing them with information on a particular discipline and field 4/. Therefore, special librarians who are serving various kinds of developing activities like programming, project implementation and and evaluation, are defined as those who provide appropriate information, at the right time, to policy planners and decision makers, and those who are responsible for problem solving for them.

3. ROLE OF SPECIAL LIBRARY IN DEVELOPMENT ACTIVITIES

If we conceptualize a "development activity" as a system with feed-back mechanism or as an encircling flow, we could integrate the role and function of special librarians into the system, as shown in Figure 4.

The roles of the special librarians, in order to meet needs for information, are:

(1) to identify and to access to information sources,
(2) to collect and maintain information,
(3) to select and search information,
(4) to analyze and evaluate information,
(5) to process and integrate information,
(6) and to provide information to users at the right time.

In carrying out these roles effectively, special librarians have to possess a work strategy or search strategy with expertise and visions, reinforced by the use of modern information technology. Considering the work strategy of special librarians supporting developing activities, I would like to mention two important issues, i.e., one relating to the "appropriateness"; the other, to the role of "information technology."

The question of the appropriateness of a given technology is a complex issue. It is often used to be defined narrowly as a small scale, labor-intensive, low-cost technology which makes maximum use of local and indigenous resources and skills. However, taking into account the scale and degree of diversification of developing activities in recent years, the meaning of appropriate technology is more complex than the above definition implies 5/. It requires that selection of technology be considered not solely as an economic solution, but also must be regarded from a wider perspective based on the diversified and multi-leveled needs of development.

"Appropriateness" implies the idea of responsibility to select, modify, integrate, and create a solution that improve the actual situations confronted by development planners, decision makers and problem solvers, with minimal negative impact. This is a discussion on an appropriate technology, but the same be applied to the question of the appropriateness of information.

Information technology, based on the development of computer and telecommunications technology, has been a strong impact on the library and librarians' circumstances. In Asian region, the number of computers installed has been increased considerably in recent years, as elsewhere in the world (Table 6). As to computerization of information, the type of letters or characters to be processed is the most essential factor. And for those Asian countries in which the Roman alphabets can be used widely, computer facilities developed by North America and Western Europe, are easily introduced. But now, by the technical developments and by the help of excellent softwares, information processing of non-Roman character languages overcomes the difficulties in those Asian countries which use symbolic and ideographic characters 6/. These developments have been stimulating the needs to use computer facilities in every aspect of economic, administrative, and academic activities in East-Asian countries.

However, we have to assess benefits and limitations of computer technology in the development activities and library, too. Computer is not a "deus ex machina" which can solve every difficulty in development stage. There exist some over-optimistic views on the future role of computer that with help of computer and telecommunications technology, developing countries could move from an agrarian economy into an information economy, passing over a much debated phase of industrialization 7/. But it seems too simplified and naive to say that computer makes an agrarian economy jump into an information economy in one stretch.

Information economy or information oriented society is a concept equivalent to that of a post-industrial society. Computer and telecommunications technology comprise one of the driving forces of information oriented society, but it is a weapon, a tool and an instrument of man who makes use of it. The tasks and lessons which have been proved by the historical proces of economic development are that it is essential for an agrarian society to improve, if necessary to revolutionize, an old agrarian economy, its obsolete and static production method, its old institutions and way of thinking, and to build a sound basis for self-sustained agricultural production in parallel with indigenous industrial production.

One can not pass over the historical process by manipulatin modern information technology. The tasks for us are the "informatization" of agricultural activities, the "informatization" of industrial activities, improvement of agricultural production through the maximum use of information technology and increased industrial productivities by the support of advanced information technology. Information technology has a value in itself, but the most valuable thing it has is its power of transformation.

4. TASKS AHEAD

Information technology entails a power of transformation. The fundamental premise that is indispensable to materialize this potential to transform, is not the hardware itself, but the existence of software and humanware. Without effective and flexible softwares, and without intelligent and experienced personnel, one cannot make the maximum use of computers, terminals, telecommunications facilities, networks, machine-readable catalogues, commercial on-line dababase services and optical discs, etc.

The most important task for the special librarians and information specialists who are serving in development activities is to build up a basic infrastructure for information services within the organization in which they are working, and then in the country they are living in, and finally in the region they are communicating. In taking the task and in implementing the program set forth by the task, special librarians themselves have to be planners, decision makers and problem solvers. Leadership, sense of responsibility, patience, stabborn spirit and vision are required in carrying out these tasks.

Compared to the academic library and public library, the special library is usually smaller in its scale, collections and personnel. However, job requirements and time constraints are much severe than their colleagues serving professors, students and town people. Special librarians are working on specialized information and have specialized reference capabilities. Consequently, they have a propensity to cooperate in doing their work, to establish informal and formal networks and to exchange opinions and ideas, and even to console each other.

In this country of Japan, The Special Library Association (SENTOKYO) was established in 1952, just seven years after the end of World War II, for which the most important aim has been mutual cooperation 8/. It is a spontaneous organization that is supported financially simply by membership fees and it receives no subsidiaries from any government office. SENTOKYO has a membership of 635 special libraries, one third of all special libraries in Japan, with seven district councils. In the Association, branch libraries of government organizations, information service sections of private companies and libraries of local chambers of commerce and industry are cooperating in organizing seminar and training courses, in studying on the common topics like copyright regulation. Inter-library loan arrangement is a long established practice among SLA members. Some fifteen member libraries are now collaborating on the indexing work of a journal article database, entitled as the "Joint" (Index of economics and industrial periodicals), which is being accessed on-line through commercial service network by many members.

A national cooperation will be a pre-requisite of a local cooperation. Special librarians in this part of the world have been working, hitherto, in isolation, overloaded by their tasks and jobs. The informal human network, at first, and then the regular forum to exchange experiences and expertise for them, and finally cooperation channels through the region, will promote common interest for all of us here, today.

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Table 1. Performance of National Economy

	GDP per Capita($) (1984)	GDP Growth Rate(%)		Average Rate of Inflation (%)		Production Growth -Agriculture(%)		Production Growth -Industry(%)	
		(65-73)	(73-84)	(65-73)	(73-84)	(65-73)	(73-84)	(65-73)	(73-84)
Low income countries									
Bangladesh	130	(.)	5.0	7.3	9.9	0.4	3.1	-6.1	7.6
India	260	3.9	4.1	6.3	7.8	3.7	2.3	3.7	4.4
China	310	7.8	6.6	-0.9	1.8	2.9	4.9	12.1	8.7
Sri Lanka	360	4.2	5.2	5.1	14.9	2.7	4.1	7.3	4.8
Pakistan	380	5.4	5.6	4.8	10.8	4.7	3.0	6.6	7.8
Sierra Leone	310	3.7	1.8	1.9	15.4	1.5	2.0	1.9	-2.5
Middle income countries									
Indonesia	540	8.1	6.8	63.0	17.4	4.8	3.7	13.4	8.3
Philippines	660	5.4	4.8	8.8	12.9	4.1	4.0	7.4	5.3
Thailand	860	7.8	6.8	2.5	8.2	5.2	3.7	9.0	8.7
Fiji	1,810	(1965-84)	3.1	5.6	9.0	--	--	--	--
Malaysia	1,980	6.7	7.3	1.2	6.2	--	4.2	--	8.7
Republic of Korea	2,110	10.0	7.2	15.5	17.6	2.9	1.7	18.4	10.9
Hong Kong	6,330	7.9	9.1	6.4	9.8	-0.6	0.8	8.4	8.0
Singapore	7,260	13.0	8.2	3.1	4.4	5.7	1.4	17.6	8.6
Morocco	670	5.7	4.5	2.0	8.3	4.8	0.6	5.4	3.7
Chile	1,700	3.4	2.7	50.3	75.4	-1.1	3.4	3.0	1.9
Industrialized country									
Japan	10,630	9.8	4.3	6.0	4.5	2.1	-1.3	13.5	5.9

Source: World Bank, World Development Report 1986

Table 2. Information Generation in the World (from 1972 to 1982)

year	journal article	patent	technical report	conference proceeding	dissertati	total
1972	1,025,200 (44.5%)	1,032,000 (44.8%)	95,500 (4.1%)	75,400 (3.3%)	77,500 (3.4%)	2,305,600
1977	1,339,200 (50.6%)	998,200 (37.7%)	101,300 (3.8%)	121,500 (4.6%)	87,100 (3.3%)	2,647,300
1982	1,741,000 (53.7%)	1,052,500 (32.4%)	130,000 (4.0%)	221,500 (6.8%)	96,700 (2.9%)	3,244,800

Source: Mitsubishi Research Institute, A Survey on the Promotion Policy of International Flow of Scientific and Technological Information (Tokyo: the Institute, 1984), printed in Japanese (Kagaku Gijutsu Joho no Kokusaiteki Ryutsu no Arikata ni Kansuru Chosa-Kenkyu Hokokusho).

Table 3. Breakdown by Country and by Publication Type of Information Generation in the World (in 1982)

	Japan	U.S.	U.K.	West Germany	France	Canada	Korea	Thailand	Indonesia	others	total
journal article	227,400 (13.0%)	587,900 (33.7%)	124,600 (7.1%)	143,300 (8.2%)	104,000 (6.0%)	62,700 (3.6%)	9,610 (0.1%)	1,1,250 (<0.1%)	900 (<0.1%)	479,400 (27.5%)	1,741,000
patent	440,200 (41.8%)	109,600 (10.4)	37,100 (3.5)	82,900 (7.8)	22,100 (2.1)	25,300 (2.4)	16,600 (1.5)	370 (0.03)	480 (note: in 1980)	318,200 (30.0)	1,052,500
technical report	10,300 (7.9%)	49,000 (37.6)	11,600 (8.9)	8,000 (6.1)	2,500 (1.9)	10,000 (7.7)	4,150 (3.2)	50 (<0.1)	40 (<0.1)	34,800 (26.7)	130,400
conference proceeding	26,800 (12.1%)	90,000 (40.6)	11,000 (5.0)	13,500 (6.1)	10,900 (4.9)	7,600 (3.4)	430 (0.2)	240 (0.1)	170 (<0.1)	60,900 (27.5)	221,500
dissertation	6,570 (6.6%)	13,400 (13.4)	4,200 (4.2)	11,200 (11.2)	14,000 (14.0)	800 (0.8)	3,860 (3.9)	770 (0.8)	40 (<0.1)	45,000 (45.1)	99,800
total	711,270 (21.9%)	849,900 (26.2)	188,500 (5.8)	258,900 (8.0)	153,600 (4.7)	106,400 (3.3)	34,650 (1.1)	2,680 (0.1)	1,630 (0.05)	938,300 (28.9)	3,245,200

Source: Mitsubishi Research Institute, A Survey on the Promotion Policy of International Flow of Scientific and Technological Information (Tokyo: the Institute, 1984), printed in Japanese (Kagaku Gijutsu Joho no Kokusaiteki Ryutsu no Arikata ni Kansuru Chosa-Kenkyu Hokokusho).

Table 4. Journal Article Generation (by Field and by Country)

field	year	Japan	U.S.	U.K.	West Germany	France	Canada	Korea	Thailand	Indonesia	others	total
Mathematics	1972	2.200	10.400	2.900	1.900	1.700	900	30	20	30	7.600	27.680
	77	2.700	12.700	3.500	2.400	2.200	1.100	30	40	30	9.400	34.100
	82	3.300	15.500	4.200	2.900	2.600	1.400	30	40	40	11.400	41.410
Physics	1972	8.200	23.500	5.500	5.600	5.000	3.500				19.500	72.450
	77	13.400	30.000	8.100	13.000	9.500	2.900	1.600			29.800	108.370
	82	18.200	32.700	7.000	18.800	12.200	3.200	6.200			37.400	135.780
Chemistry	1972	21.000	97.200	22.000	19.700	13.200	10.200	600	30	30	69.900	253.960
	77	53.900	119.100	26.000	33.000	17.000	12.600	900	120	60	99.800	362.480
	82	75.300	132.900	29.000	34.400	17.400	14.000	1.200	100	60	115.700	420.060
Biological Sciences	1972	24.900	87.500	13.200	24.600	12.800	10.700	170	40		66.100	240.040
	77	27.300	95.900	14.600	26.800	14.000	11.700	190	50		72.400	262.970
	82	30.000	105.500	16.100	29.400	15.400	12.900	200	50		79.600	289.490
Geoscience	1972	1.600	13.700	1.500	1.800	26.00	1.700	60	70	40	8.800	31.870
	77	1.700	17.500	2.200	2.000	2.900	1.900	60	80	40	10.800	39.180
	82	1.8.00	18.700	2.000	2.300	3.100	2.000	70	90	40	11.400	41.500
Medical Science	1972	25.000	75.000	18.700	21.200	20.300	6.900	410	200	50	64.100	232.600
	77	32.200	97.000	22.500	26.300	23.000	8.700	410	220	70	80.300	291.600
	82	59.800	171.200	38.400	40.100	33.500	15.400	450	440	100	136.600	495.990
Engineering	1972	16.500	44.900	7.900	9.000	6.400	4.100	260	60	10	33.900	123.030
	77	19.200	52.100	9.100	10.400	7.400	4.900	300	60	20	39.300	142.780
	82	23.100	62.700	11.000	12.600	9.000	5.900	360	80	80	47.400	172.270
Agriculture	1972	5.000	13.600	4.400	2.600	3.100	2.200	390	130	80	12.000	43.500
	77	10.600	32.500	11.200	2.800	7.200	5.200	760	270	320	26.900	97.750
	82	15.900	48.700	16.900	2.800	10.800	7.900	1.100	410	480	39.900	144.890
total	1972	105.200	365.800	76.200	86.400	65.100	40.200	1.920	550	240	281.900	1.025.190
	77	161.000	457.700	97.200	116.700	83.200	49.000	1.250	840	540	368.700	1.339.230
	82	227.100	587.900	121.600	113.300	104.000	62.700	9.610	1.210	800	179.400	1.741.040

Source: Mitsubishi Research Institute, A Survey on the Promotion Policy of International Flow of Scientific and Technological Information (Tokyo: the Institute, 1984), printed in Japanese (Kagaku Gijutsu Joho no Kokusaiteki Ryutsu no Arikata ni Kansuru Chosa-Kenkyu Hokokusho).

Table 5. Increase of Information Generation in Selected Asian Countries (Unit; Records)

		Korea	Indonesia	Thailand
journal article	1972	1,920	240	550
	1977	4,250	540	840
	1982	9,610	800	1,210
patent	1972	1,995	-	-
	1977	3,139	-	-
	1982	16,593	480	372
technical report	1972	1,040	10	30
	1977	2,730	30	40
	1982	4,150	40	50
conference proceeding	1972	80	90	100
	1977	160	120	140
	1982	430	170	200
dissertation	1972	426	16	1,039
	1977	198	26	849
	1982	3,839	40	770
total	1972	5,461	356	1,719
	1977	7,651	716	1,869
	1982	34,622	1,530	2,642

Source: Mitsubishi Research Institute, *A Survey on the Promotion Policy of International Flow of Scientific and Technological Information* (Tokyo: the Institute, 1984), printed in Japanese (Kagaku Gijutsu Joho no Kokusaiteki Ryutsu no Arikata ni Kansuru Chosa-Kenkyu Hokokusho).

Table 6. Number of Computers Used in South-East Asian Countries (1983)

	Thailand	Indonesia	Singapore	Philippines
Microcomputer	4,114	2,900	952	437
Minicomputer	619	835	186	434
Large computer	37	45		69

Source: Based on the survey of Center of the International Co-operation for Computerization (Kokusai Johoka Kyoryoku Senta, Tokyo)

Note: 1) For 1982 of Singapore and Philippines
2) Personal computers are included in microcomputers.

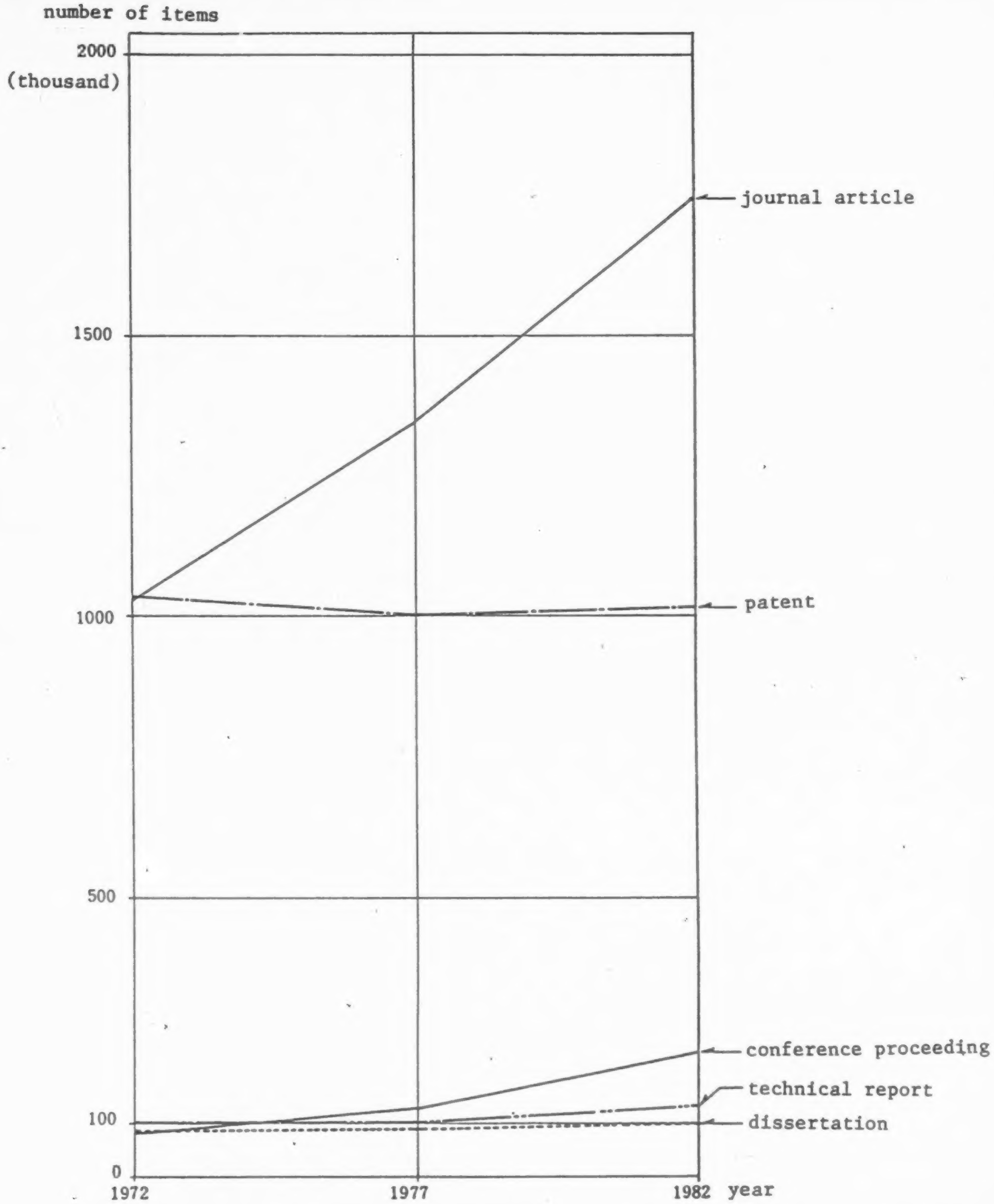
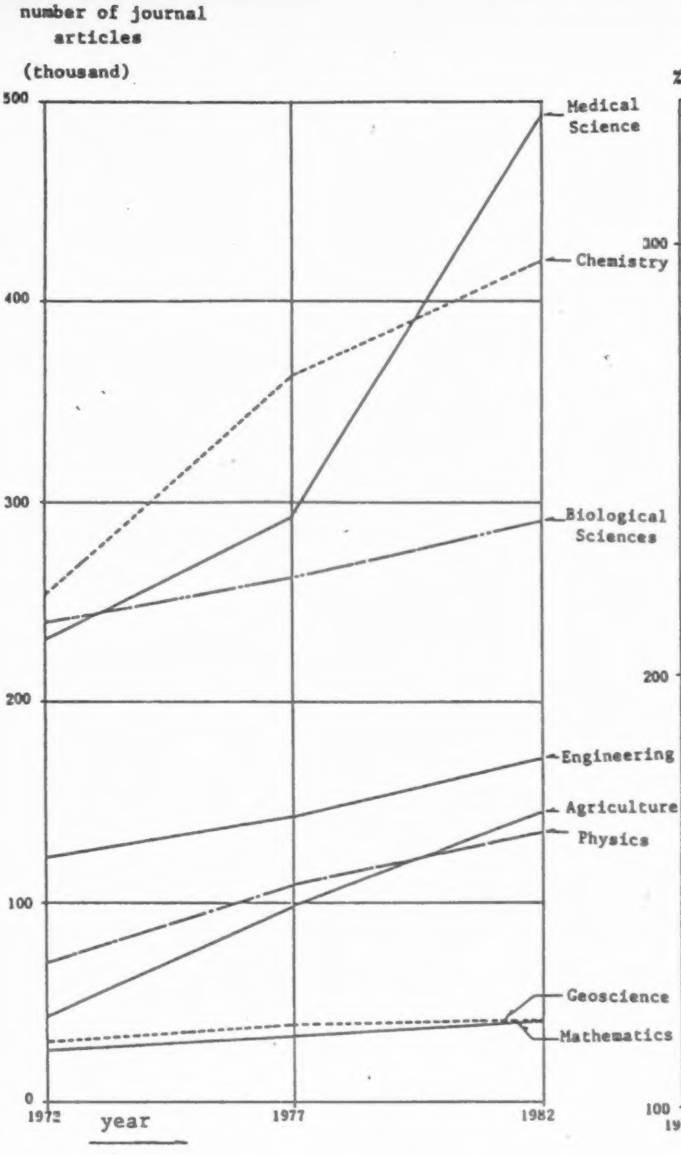
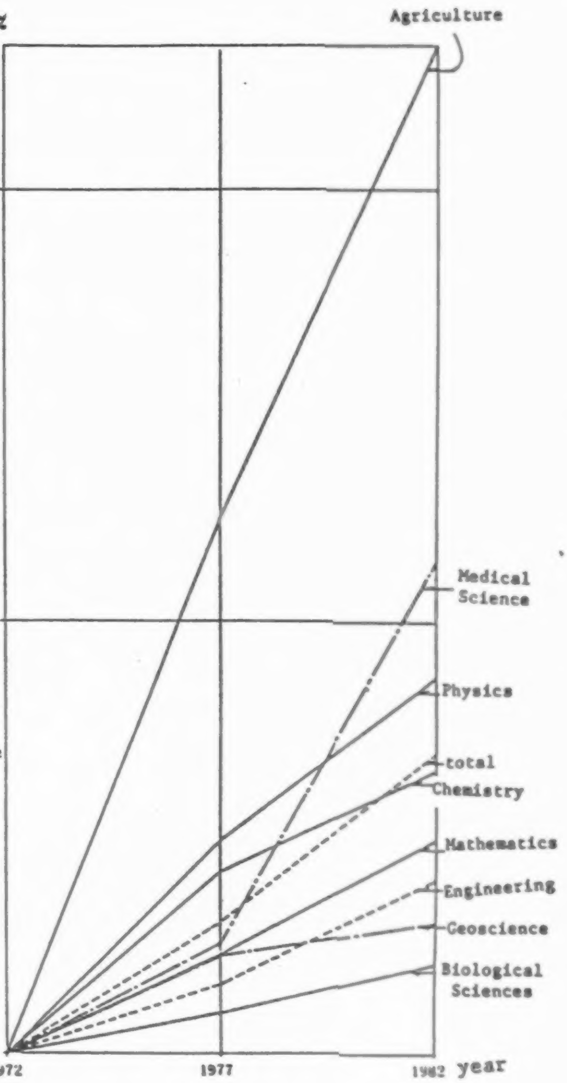


Figure 1. Information Generation in the World

Source: Mitsubishi Research Institute, A Survey on the Promotion Policy of International Flow of Scientific and Technological Information (Tokyo: the Institute, 1984), printed in Japanese (Kagaku Gijutsu Joho no Kokusaiteki Ryutsu no Arikata ni Kansuru Chosa-Kenkyu Hokokusho).



Growth Rate of Journal Article Generation (By Field)



Journal Article Generation (By Field)

Figure 2

Source: Mitsubishi Research Institute, A Survey on the Promotion Policy of International Flow of Scientific and Technological Information (Tokyo: the Institute, 1984), printed in Japanese (Kagaku Gijutsu Joho no Kokusaiteki Ryutsu no Arikata ni Kansuru Chosa-Kenkyu Hokokusho).

Figure 3. Categories of Information

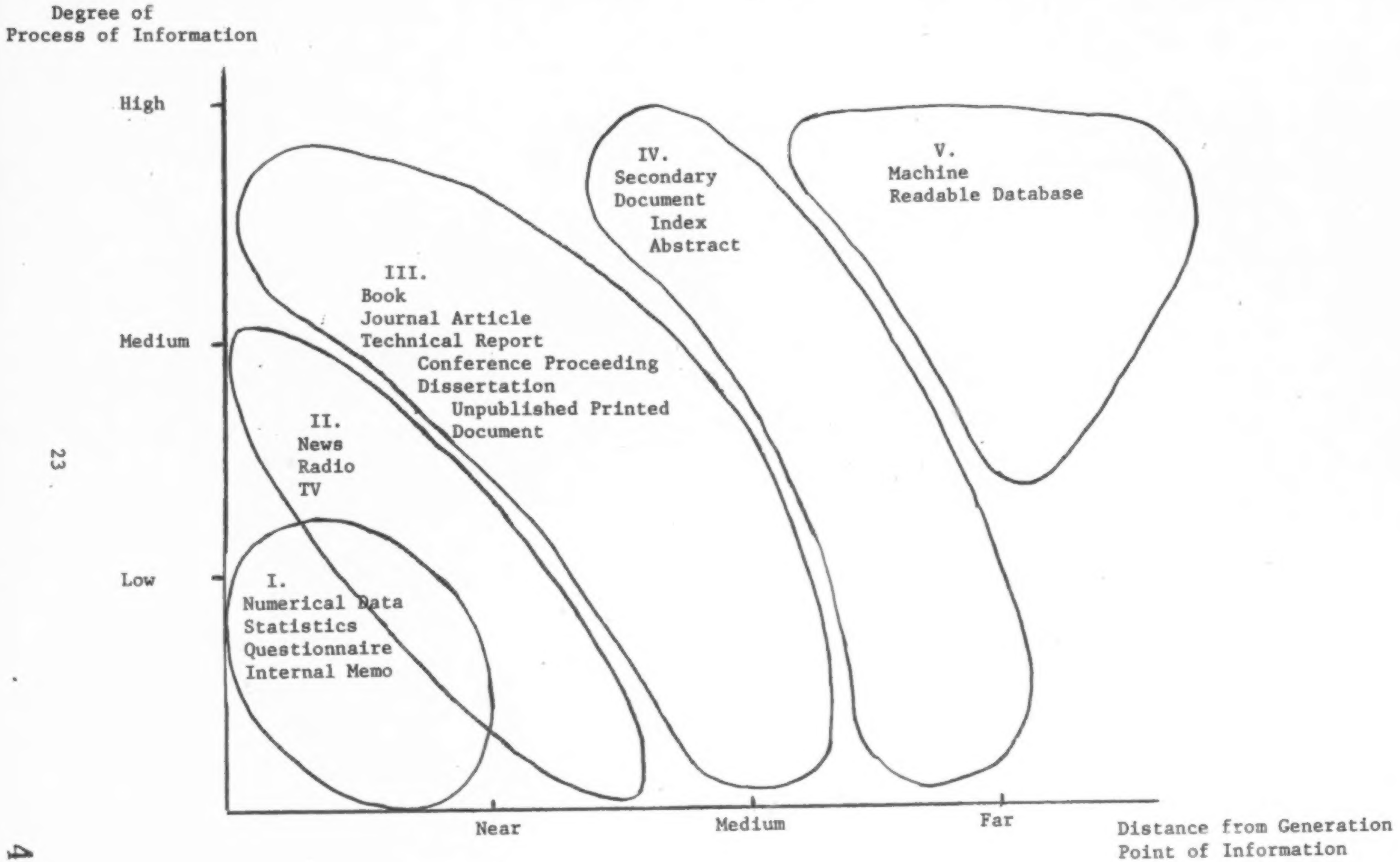
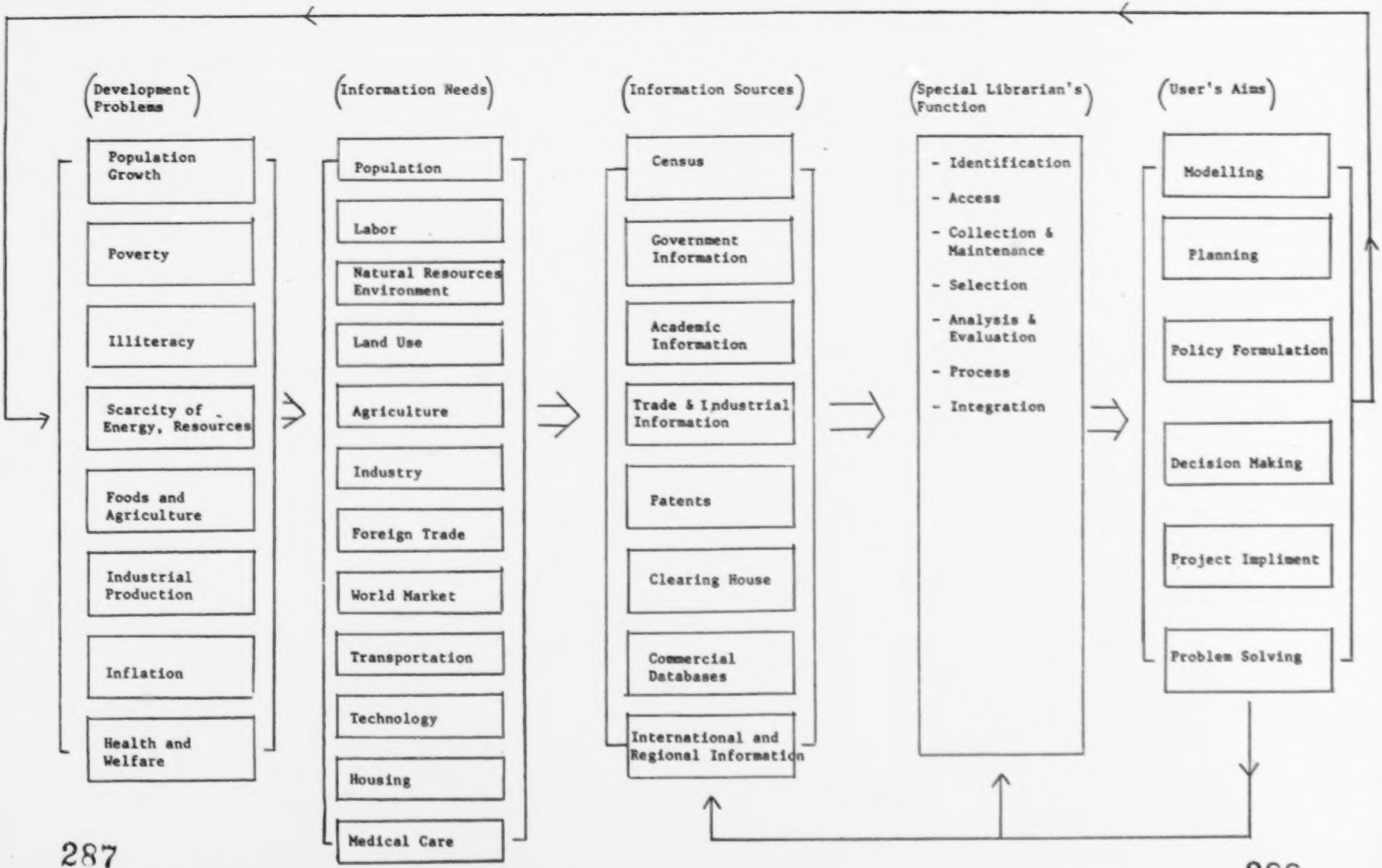

Degree of
Process of Information
High
Medium
Low
I.
Numerical Data
Statistics
Questionnaire
Internal Memo
II.
News
Radio
TV
III.
Book
Journal Article
Technical Report
Conference Proceeding
Dissertation
Unpublished Printed
Document
IV.
Secondary
Document
Index
Abstract
V.
Machine
Readable Database
Near
Medium
Far
Distance from Generation
Point of Information

Figure 4. Development Information Needs and Special Libraries' Function


Development Problems
Population Growth
Poverty
Illiteracy
Scarcity of Energy, Resources
Foods and Agriculture
Industrial Production
Inflation
Health and Welfare
Information Needs
Population
Labor
Natural Resources Environment
Land Use
Agriculture
Industry
Foreign Trade
World Market
Transportation
Technology
Housing
Medical Care
Information Sources
Census
Government Information
Academic Information
Trade & Industrial Information
Patents
Clearing House
Commercial Databases
International and Regional Information
Special Librarian's Function
- Identification
- Access
- Collection & Maintenance
- Selection
- Analysis & Evaluation
- Process
- Integration
User's Aims
Modelling
Planning
Policy Formulation
Decision Making
Project Impliment
Problem Solving

IFLA GENERAL CONFERENCE, TOKYO

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Special Libraries and their role in National Development

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PRESESSION-18-E

Total Library Information System with Multi-Language Processing

by

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Total Library Information System with Multi-Language Processing

by T. Kuragano

Preface

This paper describes the use of computers in research-aided libraries, including specialized libraries. Any research library in the areas where the Roman alphabet is not used, like Japan, cannot evade the problem of multi-language processing. Therefore, I hope that you will understand the present technical level of the total system in which this problem has been considered.

First of all, in the first chapter, I explain the problems that the research libraries have at present and clarify the fields in which the current computer system can be utilized as the total system.

Chapter 2 introduces the total library information system with multi-language processing, explaining concrete examples of design.

Here, I describe how the computer system can refer to information as a more effective and practical tool as compared with a catalog card system.

Then, I explain how this system can be a means to provide high-quality services to the users of the library, such as researchers, and that it can function as a powerful tool for librarians to carry out their business smoothly and can reduce the technical processing procedures.

Finally, in Chapter 3, I provide a picture of the future library system, focusing on the progress of the computer technology.

I. Problems Confronting Libraries and Computers

1. Enlargement and Enrichment of Collection

A library, especially a research library supporting researchers, engineers, and experts, must provide a comprehensive collection of material to users regardless of its scale.

The time spent in study by a researcher or an expert is a precious resource in developing the society or firm. Every library must provide an interdisciplinary and profound collection of information so that a researcher can do more creative work, by eliminating duplicate research, by verifying the original text of the cited literature promptly, or by using information publicized by other researchers. In other words, the opinion has become widespread recently that every library must prepare backup of their comprehensive collection for their users so that they can provide any document needed for research promptly.

However, it is very difficult for a single library to have a complete collection, even if it is for only a limited field. Therefore, the libraries have endeavored to form a library network for each area or field to provide a more complete collection of material for their users, utilizing the Inter-Library Loan (ILL) as a member of that network.

To keep the ILL transparent for the users, it is necessary to prepare a union catalog, where the authority is controlled consistently, and to transmit slips frequently between the libraries. That is to say, technical processing will be specialized by assigning many librarians to their own fields, but it will become more unvarying than it is. Unfortunately, it cannot be expected that the budget for the personnel expenses will be sharply decreased.

2. Improvement of Service Requested

Recently, under the circumstances where the field has been subdivided or specialized, as well as become interdisciplinary, users have been unable to get the required materials without the librarian's aid and easy-to-use reference tools, even if a huge collection with two- or three-million volumes has been classified and arranged completely.

To save the time of users, including researchers, and to make the collection active, it cannot be said to be a satisfactory service for the librarian to just point out to the user the field shelf or card box in which two or three hundred volumes of twenty or thirty thousand references are contained. The library must present only a few material that have significance to the researcher who has come to get them.

The rate of two or three volumes to two or three million is one to one million. When two or three hundred references are selected from twenty of thirty thousand volumes, this rate becomes one to one hundred. Therefore, to make the first service applicable, it is necessary to identify small groups of one million sets. When selecting two sets from one million sets, the number of combinations is 499.9 billions.

On the other hand, when one hundred sets are selected, the number of combinations is only 4,950. That is, there is a difference of one-hundred million times in the complexity between these two services.

With the enlargement of the collection, the number of languages to be handled has been increasing. When the collection of English is compared with the collection of English, Japanese, Russian, Chinese, Arabian, and Korean included, there is a difference in the quality of the service requested, such as the subject reference, etc.

However, the shortage of librarians in charge of these high-quality services has become chronic. In addition, it is only the catalog card that can support the librarians strongly as a tool at present.

3. Large Quantity of Duplicate Work

At present, most of the libraries hold and manage a number of files, ledgers, and cards, dividing the work of acquisition, cataloging, and circulation among independent groups.

Most of the files contain duplicate items. For instance, the same title of a book is written in the order file, the accession file, the card boxes installed at some places, and the loan file.

As a result, the work of duplicate typing and sorting, repeated filing, and sequential reference of files have become routine for librarians, and much time has been wasted in the library. For this reason, librarians are unable to give high-quality service to the users.

Additionally, as you know, this duplicate work has become increasingly complicated. The ILL has become confused since there is a difference in the bibliographical standards and in the spelling methods.

4. Computer and Technical Processing in the Library

The progress of computer technology has enabled files to be integrated and a single data base to be logically accessed simultaneously from a number of terminals. Since the physical ledger file could be accessed by only one person at a time, the files were naturally classified by business. Additionally, since only a few persons can stand in front of the card boxes, it is not practical to perform all services around the card boxes. The on-line terminal can access the data base from a place, far removed from the data base, as though there were a file on each person's desk.

The function of data communication is a technique established between a host and a terminal, which has been actually used for a long time. For instance, one of the IBM products, CICS has been used all over the world for more than 20 years. Depending upon the system, thousands of terminals are connected to one host.

The data base technology has made rapid progress and today, a data base with twenty or thirty million records are being used widely. However, there is a problem with the data base on how to establish compatibility between rapid access and data security. For a data base that has a complicated point of access, like the bibliography handled in the library which has a diverse relationship between records, a dedicated data base management system has been developed.

Of the IBM products, the newest-version library system DOBIS, based on the operating results of more than 10 years, was provided in 1985 as Release 4, enabling the handling of various material in the huge data base unitarily.

For instance, a book with a complicated bibliographical structure is similar in data structure to the copy structure of periodicals, and if this structure is forcefully flattened so that books and periodical publications are controlled separately, there will be many cases where it will be difficult to judge where the material belongs. The time spent in judging where the materials belong is wasteful from the point of looking for information. The current computer technology realizes the theme of unified handling of all materials that the ISBD(G) proposed even on the data base.

In creating an integrated data base, the third technical problem is multi-language processing. In English-speaking areas, the sequence of processing can be performed by using at least 128 characters, as shown by ASCII. In Europe, most of the languages can be processed using 256 EBCDIC characters, however, in Japan, more than 7,000 types of characters are used normally. This is also true of

China and Korea. On the other hand, if only twenty or thirty types of characters are used, two or three hundred or thousand character types will be required of a system handling multiple languages like the library system.

For the character code, all manufacturers, including IBM, are processing Japanese and Chinese data by using a 2-byte code as well as a 1-byte code, like EBCDIC. The Japanese Industrial Standard (JIS) defines 6,802 characters, including Kanji characters and other characters. The IBM Japanese character set is composed of 11,560 characters, including characters selected by the users. Additionally, an area with twice the space of this capacity has been reserved as the IBM save area for future extension. However, it is only recently that this 2-byte code has begun to be used internationally, just as EBCDIC, for data communication and data bases. Now, the above data communication function CICS can handle the 2-byte code just like EBCDIC and can use it together with EBCDIC.

II. Total Library Information System

1. DOBIS/LIBIS/WINE

At present, making use of the computer technology, the total system, which performs multi-language processing, can be constructed within the appropriate budget for a short period.

I shall introduce a system under development in Waseda University, one of the most famous universities in Japan. In Waseda University, this system is positioned as a utility essential to support academic activities, called the "Waseda University Academic Information System", or WINE (Waseda Information Network). The development of this system was started in April, 1986, and will be completed next April.

This development has been made, based on the IBM Dortmand and Lenven Library Systems with Periodicals Control Release 1.4 called DOBIS, and Data Communication System CICS Release 1.7.

Waseda University has a collection of three million volumes in 32 libraries, which contain Japanese, English, Russian, Chinese, etc., materials.

Users will be able to use the copies stored in Waseda University from 5550 Intelligent Personal Computer Terminals, of which more than 300 sets are to be installed in Waseda University. In addition, the users will be able to refer to the information and reserve the book loan freely from the personal computer in each seminar room as well as the public access terminal in the library. The system will perform the ILL processing within the network connected to 32 libraries automatically.

2. Function as a Reference Tool

The users access the bibliography or collection information through the access points. The total system is similar in this respect to the card, but it is different in some respects. The total system provides more support to the user than the conventional card box.

Users can select optional access points, such as the name, authority, title, subject, etc., from a terminal, or by abstract words as well.

When referring to the information, you input the words or phrases, then, the screen displays one entry before the entered search term and then the following 13 entries in alphabetical order.

One of the defects in on-line referencing claimed by many users is that browsing cannot be executed; however, the IBM system, DOBIS, can perform the summation of access points and users can scan all titles sequentially to the end, if necessary.

By selecting one of the access point entries, a list of the bibliography of this entry can be displayed. The cross-reference can be also displayed at the same time.

When the name, authority, subject, etc. are selected as access points, it is very important to the user to know whether the cross-reference function can be used between the access points. For instance, a user who is searching for material based on the name Hector Hugh Munro cannot accomplish his purpose until he reaches the access point "saki" using the cross-reference function. For the works of Frederic Danny, the user cannot make a complete inquiry until he reaches the access points of Ellery Queen, Ellery Queen, Jr., and Barnaby Ross. For the subject, the cross-reference function plays a more important role. Does the researcher inquiring into the

Quakers know that the library has integrated all of their subjects into the Society of Friends on earth?

For card cataloging, the cross-reference function creates many types of reference cards and inserts them into the required sections in the card file. On the other hand, DOBIS creates an inverse reference automatically by inputting the information corresponding to one of these two cards.

By inputting a one-character command, the user can verify the cross-reference between the access point entries or verify the relation between the documents.

By selecting one bibliography from the above list, its details and collection status are displayed. In addition, information, such as the ordering material, loaning materials etc., can also be displayed.

Complicated search can also be performed with AND or OR conditions.

3. Function As a Technical Tool

All the business operations are connected systematically by the computer in the Integrated Library Information System. This is the big difference when compared with a general information retrieval system.

By inputting the bibliographical information of the magnetic tape or MARC, into the system beforehand, the input procedures by the librarian can be reduced.

It is easy to order the materials that have been inputted into MARC. The librarian can finish all processing by only setting the account information (ex. budget item, vender, etc.) without inputting the bibliographical items. Then, the system checks the budget and prints out the necessary slips.

When ordering material that have not been inputted into the system, the user inputs only the brief bibliographical items, which are also used for cataloging. More detailed items are added to these items at the time of cataloging.

The system automatically monitors the ordered materials until they are received. In addition, it issues a demand letter, according to the demand policy defined by each library, and prints out a warning list of missing volumes.

At the time of receipt, the user refers to the system catalog and responds "yes" to the inquiry whether the receipt has been completed. Then, the receipt work will be completed immediately.

The system user can refer to the ordering materials as well as the materials that have been registered in the catalog. This will prevent the waste in budget caused by duplicate orders. In addition, a user can reserve the loan of the material being ordered. This function can be suppressed, depending on the operating policy defined by the library. However, if a user has reserved the material being ordered, the specification of this reservation will be displayed on the screen at the time of receipt. Therefore, the user can take the loan procedure on the spot.

Cataloging on the total system enables the library staff to be freed from the inconveniences of the card method. The librarian with authority (which has been set for each system user beforehand) can add or modify the bibliographical information at any time, including the time before ordering and after loan. This freedom was actually difficult to attain in a catalog that is distributed in a number places such as a card catalog. For the card catalog, modification is difficult after the distribution of the cards as it requires much labor. For the on-line catalog, the correct catalog can be referred to from all terminals in the network by modifying the catalog in the data base from the terminal of the person in charge of the catalog.

In other words, the total system can input the bibliographical information in stages. Additionally, it can loan a volume required urgently by using only brief bibliographical information and add the detail bibliographical information at the time of return.

The documents correspond to each access point. In this respect, the total system is similar to the card box. In the description itself, the DOBIS uses the access point entries for the items, except the indication of responsibility and notes. That is to say, by changing one of the access point entries, the descriptions of all corresponding documents are also changed.

Showing an example of subject, the term "data base" has often been written as "database" recently. Immediately after rewriting the access point as "database," the subjects of all corresponding documents are changed from "data base" to "database." This function can also be used when inserting the years of birth and death into the entry of the name authority file.

The material registered in the data base are managed by the kind of material based on the operating standard of each library and loaned to users.

Book loan processing is completed by scanning the label pasted on the material and the user's ID card from the terminal. Then, the system checks the return date, user's loan authority, etc.

It is a matter of course, but the authority to access the system can be finely set by the business operation and it is designed to prevent peeping into a user's privacy or making careless data revisions.

III. The Future Development of the Library System

It goes without saying that the role of the library is to provide information and documents that the researchers and other users require.

As the collection of books and information increases, the need for a computerized library system to provide better access for the librarians and the users has become evident. The system that provides such access is the Integrated Library Information System.

Let us take a closer look at this system, which will be categorized into three facts.

The first point is in terms of the contents to be stored in the data base. Even though multilingual processing has become possible recently, the system for storing whole sentences and data retrieval concerning parts of materials will be considered to be incorporated into the library system as an actual practical business affairs system, not as an experimental system. This does not mean that printing will become unnecessary. Printing onto paper is a far better method of communication compared to displaying on the screen. It is said that human beings can identify approximately 16 dots/mm images on the screen, but they can read much more if they are printed on the paper. The resolution of the display used in the ordinary personal computer is approximately 640 x 200 dots. This is equivalent to a size less than 40 x 12.5 mm of printed material. Larger pages, such as the double A4-size in spread are not uncommon in printed material.

It is considered that the main role of the library system will be the offering of secondary information such as catalog data, not the offering of the information itself, for quite a long time to come.

The second point is with respect to the growth of users through the expansion of the public access network. In this case, with the expansion of the range of users, requests from users using personal computers and terminals other than the terminals that the library offers cannot be avoided. If multilingual processing is performed in this case, it will become necessary for the character sets between terminals to be common. For instance, if only Japanese is used, there is a standard, but, if low-grade terminals or old personal computers are used, the library system will not support them. At present, there is no standard among manufacturers on the multilingual character set containing other than Japanese. The main subject seems to be how to treat the characters that cannot be displayed on the screen or inputted into the terminal even if the data are stored in a host computer.

The third point is the various types of requirements brought about by user expansion, which will result in the growth of the inter-system network. The distributed data base system that enables on-line data exchange among library network systems will be realized in the future. At present, IBM offers a distributed data base system intended function with the CICS inter-system communication function. However, means for standard communication among the host computers of different manufacturers have not yet been established. However, this is a technological field that will be developed rapidly in the coming 10 years. Therefore, it might be better to plan a library and network procedure by predicting the coming of such an age.

In closing, I would like to thank all of the members of Academic Information System Project Room of Waseda University for the their kind cooperation in making this report.

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Special Libraries and their role in National Development

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Introduction to The KIT Library Center:

Its Concepts and Methods

by

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Abstract.

Basic concepts and methods of the Kanazawa Institute of Technology Library Center is presented in this paper. Its roles in education and research as a university library are discussed in detail. Its roles as a technological information center for the KIT graduates as well as for the local community are also described. With regard to the Subject Librarian System at the KIT Library Center, its great advantages have become clear in a full-scale reference service and in the educational and research roles of the KIT Library Center. A brief review on a fully automated library information system at the KIT Library Center called LINKIT is given. Finally, results of statistical evaluation on the KIT Library Center are presented.

1. Introduction to the KIT Library Center

Before considering some of the unique features of the Kanazawa Institute of Technology Library Center, it would be useful to mention some of the institutional characteristics of the mother institution, namely, the Kanazawa Institute of Technology (hereinafter, abbreviated as KIT). The KIT is a technological university with eight engineering departments: mechanical engineering, mechanical systems engineering, electrical engineering, electronical engineering, computer engineering, management engineering, civil engineering, and architecture departments. The institute offers both undergraduate and graduate (master's and doctor's) programs with student enrollment of about 6100. The KIT was established in 1962 under three founding principles, which are the nuturing of human resources, the technological innovation and the cooperation of academy with industries. The KIT has been well known in Japan as an innovative university which fully utilizes computers in various fields of academic research, education, as well as in a wide range of administrative procedures.

The expansion of its research and educational activities, especially the establishment of the graduate programs necessitated the reorganization of the existing library in order to cope with such new demands. In 1978 the KIT formed the Preparatory Committee on Library Reorganization and asked several outside experts both in Japan and abroad to serve as its advisory members. After a year-long thorough survey of the library systems not only in Japan but also in Europe and the United States, the Preparatory Committee in cooperation with advisory members submitted a final and very ambitious plan for the new library system to the KIT Board of Trustees. Based on this plan, the construction of the Kanazawa Institute of Technology Library Center began shortly afterward. The inaguration of the KIT Library Center was held on June 1st, 1982, to commemorate the 20th anniversary of KIT.

The main characteristics of the plan were as follows: The new library should be useful (1) as a key library in the field of engineering, (2) as a key facility for educational and research activities at KIT, (3) as a key facility for the KIT's almuni at large, and (4) as a key facility for the KIT's extension services to local communities. In order to accomplish these objectives, the new library should not be a conventional type of library akin to a warehouse of books and materials. It should be a library that would be truly useful as the central core of university education and research. The plan was free from traditional restrictions that define the roles of a library in a narrow limited range. What are the quickest means to offer its facility and stored information to the users ? What is the most efficient way to run and operate a library ? To answer these questions, the KIT has decided to extensively introduce computers in the Library Center.

Today, computers are being used extensively in almost all stages of library operation; i.e., selecting, monitoring, indexing, and retrieving of materials. As a result, we have created what is known as " cardless library", the first of its kind in Japan and have done away with index cards completely. Concerning its physical organization, the KIT Library Center consists of four major sections; namely, the library, Computing Center, CAI (Computer Assisted Instruction) section, and AV (Audio-Visual) section. Furthermore, the Library Center does not confine itself to collect and store traditional library materials but it also engages in providing all types of information resources, including general reference materials, audio-visual materials, and materials for CAI. These are the reasons why we named our reference library " the Library Center ", not just a plain " library ".

2. Main Characteristics of the KIT Library Center

First of all, we would like to mention the four principal functions of the KIT Library Center which are as follows:

(1) An Educational Center

It is very important to stress the educational and learning roles of the Library Center. University libraries in Japan have been traditionally research-oriented and there has not been in existence a truly education-oriented university library. We believe the Library Center is most useful when the students use it to enhance independent studies. Instructions on independent-learning and how to use the library are included in the school curriculum under a course titled " Library Information Techniques". This new course was created so that the use of the library is closely correlated with classroom lectures and/or laboratory experiments. The Library Center, unlike conventional university libraries, is closely tied in with the mainstream of teaching and training activities provided by KIT.

(2) A Research Center

One entire floor of the Library Center is dedicated to reasearch activities. Here latest documents, periodicals, statistics and data both from Japan and from abroad are collected and made available to the researchers. The online computer terminals are installed on this floor and connected to both domestic and international information centers, thereby the information unavailable at the Library Center are also accessible through this system. In other words, both research materials and information desired by the researchers are promptly provided at this center.

(3) A Local Information Center

The Library Center's facilities and functions are opened to the local community in accordance with the founding principle of the KIT. This is one way for the KIT to fulfill its responsibility as a university open to the community. As a technological institute located in the Hokuriku Region of Japan, advancements and achievements reached by the KIT in the fields of education and research are feed back to the local community through the LC. The Library Center services are made available to the local area for promotion of community culture, industries, and other activities of the local residents.

(4) A Technical Information Center for the KIT Almuni

The Library Center provides latest and specialized information to the KIT graduates who are active in various professional fields throughout Japan. The Library Center is expected to be instrumental in keeping the KIT graduates abreast of

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technological and scientific developements by supplying them with the latest technological statistics, findings and innovations. In addition, various seminars and meetings can be planned and held under the auspices of the Library Center to satisfy the different needs of a highly industrialized, technologically advanced society. Life-long education, so far only an idea, can now be realized. In other words, we would like all present students and the almuni to make full use of the Library Center which is always ready to offer life-long education.

In order to accomplish the preceeding objectives, many new ideas and efforts have been implemented as follows:

1) Establishment of the Subject Librarian System.
2) Creation of a new library user education course.
3) Implementation of the KIT Library Information System.
4) Implementation of a fully automated audio-visual facility.
5) Enhancement of the Computer Assisted Instruction System.
6) Enhancement of the central computing facility.

3. The Subject Librarian System

Since the Subject Librarian System at the KIT Library Center was described in detail by Chiku (1983) and Sakai and Chiku (1984), this will not repeat it again here except a brief review of their papers.

It is very important for a university library to determine correctly what sort of information must be stored and provided for its users, and then, to choose the necessary materials out of the ever-expanding huge volume of data and information. The next important question is to determine who should make such

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choice of the materials. It is obvious that the individuals who are thoroughly familiar with the functions of the university, encompassing both its educational and research aspects, are most suitable in making such decision. The faculty, who are involved both in teaching and research, are best qualified to undertake this role. First of all, each member of the faculty is a specialist in a certain academic discipline. For example, he is able to grasp and evaluate the necessary information systematically. Secondly, the faculty are best qualified to evaluate the most up-to-date information as well as highly advanced, specialized data. Thirdly, since the faculty are in direct contact with the undergraduate and graduate students through teaching and advising, they can best judge and decide what kind of information must be supplied to the students.

Based on the concept that professional educators should become the core of the university library, the Subject Librarian System has been instituted. Currently, there are twelve the Subject Librarians(hereinafter, the Subject Librarians will be abbreviated as SLs) which include lecturers, assistant professors and professors all having doctral or equivalent qualifications. They represent specialized majors fields at the KIT: mechanical engineering, mechanical systems engineering, electrical engineering, electronical engineering, management engineering, civil engineering, computer engineering and architecture. Other specialized fields within general education such as humanities, social science, and natural science are also represented. All the SLs are responsible for selecting and organizing the materials to be stored in the library, advising library users, referencing, and coordinating important administrative processes in the KIT Library Center. The SLs are professors who teach in classrooms as a member of the faculty, but at the same time, they are engaged in the operations of the library, so they are also a member of the library staff. They are, so to say, " amphibians " and act as a link between the faculty, departments, and research institutes, and the university library.

In addition to the SLs, the Library Center has the library staff (hereinafter referred to as LS) who are responsible for actual running of the library. The LS perform all the traditional tasks of the librarian and also has three new tasks. First, they are responsible for the progressive maintenance of the LINKIT (Library Information System of the KIT) which will be described later on. Their second new task is to collect information to support the activities of the SLs and the library's services. The third new task is the implementation of the proposals generated from the SLs meeting.

In the past meetings on the library science held at the KIT Library Center, many questions were raised regarding the future of the SL System, its potential for success, the status of the SLs and the relationship between the LS and the SLs (see Proc. of Intl. Seminar on Library and Information Scince, 1982). Of course, there have been some difficulties among the newly appointed SLs in the first one or two years. But the university authorities understood their difficulties caused by the overworks and the burden of the SL's dual responsibilities and have taken necessary measures possible to avoid any inconvenience to the SLs

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in their research activities. The SL System is now on the right track after passing through the initial trial and error stage and the moral of the SL is high. Another aspect which might draw attention is the relationship between the SLs and the LS. At the KIT there is no difference in status between the teaching staff and the administrative staff. They all form one body working together towards a common goal. This unity is one of the special characteristics of the KIT. As a result, the SL system, which we thought would pose many problems, has been implemented rather smoothly. Both the SLs and the LS have played important roles in achieving the common objectives since the openning date of the Library Center. At present, the library section of the Library Center is operated by 37 library staff members, including 12 SLs.

4. The Library Information System of the KIT

Discussions about LINKIT's overall system including its bibliographic file structures were fully given by Sakai and Terashita (1983). Here, we will, therefore, give only a few important features of LINKIT. The next paragraphs are extracted from their paper.

The Library Information System of the KIT (abbreviated as LINKIT) is an integrated library automation system which controls and mobilizes almost all types of information needed to run an academic library. LINKIT supports various library activities under a single command structure, on an on-line real-time basis. At the same time it is so designed as to operate in unison with other information systems on campus (the student information system, the administrative information system and etc.), so that a maximum integrity within an academic environment is secured. As a bibliographic information system, the system is capable of handling records written in several different languages. The special coding system used in LINKIT contains the extended Latin, Cyrillic, and Greek alphabets, in addition to about 6,700 Chinese characters and many other symbols. LINKIT , therefore, could store and display foreign materials in the original language mode.

The current version of LINKIT supports various types of library operations, including ordering/acquisition control, cataloging, circulation control, and information retrieval. At present, two sets of IBM 4341 II are used as main frame computers at the Computing Center and, they support various information systems on campus (LINKIT is one of them) as well as educational and research projects. There are 25 computer terminals at the Library Center and they are used for information retrieval purpose as well as for business operations of the library. LINKIT's bibliographic data base stores about 600,000 data items and it is expanding with an annual increase of 100,000 data items. Information retrieval subsystem of LINKIT has been made available to five public libraries in Hokuriku region through computer network.

5. Expanded Library User Education

The KIT has decided to create a new undergraduate course referred to as the " Library Information Techniques " for the KIT freshmen. We believe that the Library Center is not just another facility attached to the institute but it is a place where materials as nucleus of all lectures are stored. It was therefore decided that techniques for utilizing academic literature for learning and research be taught in addition to the simple use of the library. This includes education on the structure and system of academic information, methods of locating materials and accessing various information facilities and libraries, utilization of variuos secondary sources, recording techniques, and techniques for oral and written presentations. Taking this new course enables students to look for their own books and relevant information in the library for writing their reports and research papers. The SLs teach this course to all freshmen. The text book for this course was also written by the SLs. Every two years, the contents of the text book are revised to incorporate up-to-date information.

6. Concept of Subject-divided Floors

The materials stored in the tower structure of the Library Center (from the fourth up to the eleventh floor) are divided by subjects. The books are classified and placed on different shelves according to different subjects. For example, the nineth floor houses reference materials in environmental and city planning engineering, while the eighth floor houses those in dynamics, applied dynamics, architectural engineering, and etc. Interrelated materials are placed close by. The disadvantages feared by the adoption of " Tower Structure" in the library system are solved by installing terminal computers on each floor. By the use of these terminal computers, user can obtain the most efficient library services from anywhere within the Library Center.

Since KIT is a technological university, more than 80 percent of library materials are concentrated in the areas of natural science and engineering. The NDC (Nippon(Japanese) Decimal Classification) proved inappropriate and difficult to utilize. It was proposed that the curriculum, rather than the NDC, should serve as the base of the classification system. The subjects in each department's curriculum cover the entire field of study from the basic to advanced levels, forming a classification system which covers the whole field from the learner's point of view. The new classification was achieved through aligning each subject group with NDC, giving the existing NDC order new curriculum headings. The next step was to arrange the materials on the shelves according to the new classification system. This was done by a cross-divisional organization of the material, and not by a simple classification based on curriculum. In the subject-divided floor system, materials relating to certain interdisciplinary subject are arranged into one place. For example, materials relating with dynamics are all grouped together under the same heading of dynamics and placed on the same subject floor, even if their fields of application are different. Thus, the system of the subject-divided floor makes students aware of related subject matters. We call this classification the KIT-LCC (KIT Library Center Classification). It is a computer-controlled classification system that records the material's NDC, curriculum classification, and bookshelf address. In this system NDC remains as unchanging permanent classification, while the bookshelf address and curriculum classification are subject to changes, whenever necessary. Thus, the system is flexible, and free from the limitations of fixed classifications. Undoubtedly, this would be very difficult without the help of a computer system. Utilization of computer terminals enables students to find the new location of the materials on a real-time basis. The LS can also easily handle classification changes and material transfer through computer terminals. In addition, we have adopted an open-stack policy which has considerably reduced the burden on the librarians. This adoption was possible by labeling a bookshelf address on each material. Therefore, any user can return the material back to the right place by simply looking at the address label.

7. Audio-Visual Materials and CAI Materials

The KIT-Library Center has a large collection of both visual and audio materials. There are 4,917 video cassette films, 1,581 audio cassette tapes, and 1,027 sets of slides and movie films. Anybody wishing to watch a film or listen to a tape has to only put the program number into a remote control board and the robot with built in logical micro-computer will automatically locate and put the requested material into a cassette deck in less than a minute. The KIT Library Center's Audio Visual Information System (the AVIS) is the system which embodies the most advanced electronics technology.

In addition to the AVIS, the KIT Library Center has

Japan's largest CAI (Computer Assisted Instruction) system both in terms of quality and quantity. The CAI uses computers in lieu of teachers. By operating the computer terminals, the students can teach himself by analyzing the answers, errors, or clues that are given by the computer. There are 25 different courses currently available on the CAI system, including general subjects, such as English language drills, recitation on physics, calculus, etc. In addition, there are more advanced courses, such as the introduction to computer programming, systems engineering, logic control, electronic circuit exercises, etc.

8. Statistical Evaluation of the KIT Library Center

In order to evaluate the amount of usage of the Library Center, a survey was conducted last year by sending out questionnaires to all KIT students who took the course on Library Information Techniques during the first half of their freshmen year. The results of this survey are summarized as follows:

(1) 84 % of the students used the Library Center either very often or often, while the 16 % of them seldom used it.

(2) The average daily spending hours in the Library Center by the students was one hour.

(3) We found that the students come to the Library Center for doing homeworks or writing reports (68%), preparing for examinations (55%), reading news papers or popular journals (44%), and using AV materials (31%). Twenty percent of the students come to the library to search

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materials or to ask reference questions.

(4) The students gave a high rating to the Library Information Techniques course, stating that this course is very useful to learn how to use LINKIT information retrieval system and to understand the use of library and its materials.

(5) 65 % of the students said that they know how to use and operate computer terminals to find materials either very well or well. 35 % of the students used computer terminals often when they look for materials.

In addition to this survey, various statistical data are provided by the management system of LINKIT, such as the book usage rate, the number of people passing through the entrance gate, the number of borrowed books, etc. According to these statistics, the number of people entering the Library daily was about 1,100 on the average. The book usage rate on the subject-divided floors was very high at about 40 percent, while the usage rate on semi-open stack floors storing the 75 % of the entire collection was about 6 percent. Taking into account the entire collection, the overall book usage was 16 percent, still very high. We note here that the book usage rate is defined by the ratio of the number of book titles borrowed to the total number of volumes on each floor. LINKIT gives us a detailed record of the use of each material. Reference materials on the subject-divided floors are inspected periodically based on the statistical data. Thus, it is possible to keep the 8,000 to 10,000 volumes on each subject-divided floor in high usage rate. Less frequently used materials are transfered to the semi-open stack floors. Despite the adoption of open stack policy and the heavy usage of materials, we found that the number of lost books is surprisingly low. The numbers of lost books were 250 out of 200,470 volumes (or 0.14 %) in 1983, 182 out of 210,274 volumes (or 0.086 %) in 1984, 179 out of 225,976 volumes (or 0.08 %) in 1985. We believe that teaching the importance of the shared use of library resources in the Library Information Techniques course was the cause of this low ratio of loss.

We should also note a symbolic occurence through computerization of the Library Center which was totally unexpected. At the begining of this paper we said that we have created a cardless library. But at the same time, we also realized that many students now have their own library cards in their room as a result of the computerization of the Library Center. In the Library Center students can obtain computer print-outs of necessary bibliographic information when they use the information retrieval system of LINKIT. If the students collect these computer print-outs systematically and files them, the students will, indeed, have their private library cards in their own room. We are overwhelmingly pleased to discover that LINKIT's bibliographic information data have penetrated into the student's private study rooms through the computerization of library.

Finally, our conclusions are summarized as follows:

(1) The heavy utilization of the Library Center by the students clearly proves the high value and the usefulness of the Library Center as an educational center.

(2) We have succeeded in improving the quality and speed of various library services and its activities by the implementation of a fully automated library information system, the LINKIT.

(3) The SL system , after overcoming initial trial and error stages, is now on the right track and is clearly a great advantage in a full-scale reference service as well as in the educational and research roles of the library. Large requests are now coming from outside users asking for reference services. These requests are mostly from the KIT graduates working at various firms. Without the SLs, these services could not be effectively accomplished.

(5) We know that the Library Center still has much room for improvement as a research center. Greater efforts by the library staff including the SLs are required to fully accomplish the Library Center's function as a research center.

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Special Libraries and their role in National Development

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THE IMPORTANCE OF TECHNICAL INFORMATION IN INDUSTRIAL DEVELOPMENT

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1. Information for What?

The word "industrial development" may sound agreeable to the majority of audience here. It is, however, not agreeable for some other people who has passed their life in academic or humanities environment. Moreover, "industry" is an abominable symbol for the suppression of working class or for the foreign pressure given by industrialized countries. Even in Japan, some professor in a library school considers the industry as monopolizing information for their own profit and weakening public library activities. I consider him to be in an error but what I regret more is that he does not understand the meaning of industry for society and for information.

This time, I will consider the importance of information for industrial development of a country. In doing so, I must examine the word information. Here, the information I am referring is not a very general information but a "technical information." If you feel the word "technical" as meaning something relating to a machine, that is not my intended meaning. I can choose another wording, "professional information," which is specific to a certain specialty but not limiting ourselves into narrow scientific and technical information. A man of a profession needs much information in doing his professional activity. What I mean by professional information is this kind of information.

2. Information in Industry

2.1 Relation between information and Industry

In general, following statements apply

1. Industry needs information and industry can spend money in information problems. (1)
2. Information circle needs industry as client. (2)

This means both industry and information are beneficial to each other. From these two statements, (1) and (2), a sub-statement follows

3. Industry employs many people for information activity. Japanese information circle considers industry as the primary source of good information specialists and as the best market. (3)

This may imply that traditional academic circle does not feel priviledged when it is ranked second after industry. (Beware: KIT does not belong to this circle).

Those university working for science and technology have little prejudice of such kind because they understand science and technology (and other applied sciences) can not subsist without industry as a whole. They are cooperating with industry, especially private universities.

2.2 What Kind of Information Does Industry Need?

At least, following kinds of information can be mentioned:

Technical information -- for better and competitive products,
Market information -- for better sales and income,
Patent information -- to keep the enterprise informed of the recent technical developments and protect enterprise from illegal competition,
Client's information -- for knowing the condition of clients:

-- Do they have difficulty with the misuse of products?

-- Are there any possibility of improving existing products expected from client's point of view?

-- Are there any possibility of creating new products based on client's need?

3. Industrial Development

To achieve "industrial development" there are several ways.

The first way is to make it in one's own way (and mostly in closed environment) without any help from outside. This can be done but it needs much efforts and investment for a very long time. Some people do so, but it is now rather rare.

The second way is to buy "industrial development" by money. There were countries that tried this way in 1960-1970's because they thought their oil production will not last more than 30 years. They had success somewhat. They now have large buildings and spacious airport and even oil refineries. But these countries have not yet brought new contribution for world-wide technology. This means it is not yet sure whether they are succeeded in buying industrial development.

Thirdly, industrial development can be made based on open and published infomation (i.e. without special contract for buying). This method requires an understanding of the whole of experience and knowledge of a certain scientific and/or technical field. This way necessitates a long term effort of educating people for several decades of years. We think usually three generations (i.e., 80 to 90 years) are necessary.

For adopting this way, we need a mechanism for extensive collection and handling of information for many decades. From information point of view, this third way is interesting to analyze.

4. Information is not always brought by paper.

4.1 Two-way communication

Usually information is recorded as writings on a paper. We must remind, however, other types of information useful for industrial development (I am not speaking of online information yet). As important ones, we can mention a) information brought by persons and b) products as information which is different from information products.

Verbal communication is certainly a communication pattern. What I mean by the word information by persons is not all of verbal communication (including lectures and discourses) but the information offered by a knowledgable persons through dialog or conversation, that is through both-way communication.

It is a famous and basic principle that two-way (or both-way) communication is far more effective than one-way communication. Written records offer only one-way communication as we can not make conversation over a book or a journal. We can make conversation, if necessary, only by way of "Discussion" and "Author's reply" in a journal in consecutive way.

Two-way communication is effective but it requires that both persons are on the same spot geographically and in time. Usually this means the necessity of travel, if not using telecommunication, and therefore the problem of cost arises.

4.2 Product as Information

The problem of a "product as information" gives another possibility. If a product is brought and if a man (or men) with sufficient knowledge examines the product minutely with enough care, the amount of information gained is very large. I remember a famous fact in the 16th century. Portuguese came first to Japan in 1543 with guns. They showed how to use and gave a gun to a Japanese. When Portuguese second visit took place in 1549, they found so many guns are in use and in production by the hand of Japanese forgers and used by Japanese landlords. Famous Oda Nobunaga who conquered the whole Japan was an early landlord who organized infantry regiments with 3,000 guns (1575). No document nor production knowhow was delivered to Japanese but just a single sample of gun created a new profession of gun making.

In modern Japan, I myself recollect that Japanese industry tried so many times this way of getting information from the real products acquired. To the success of this method there is a condition -- very important -- that the recipient of the product must be well educated and trained in that specialty.

5. Information Transfer through Text and Drawing

"Technology transfer through blueprints" may be a very convenient way. Blueprints show every necessary information on dimension, form, arrangement of component parts in producing a product. If the product needs further improvements a new blueprint comes and these show new dimensions, form etc. With this arrangement of information transfer, there is no need of "thinking."

Thus successive or continuous flow-in of blueprints from transferring side to transferred side may be efficient for the purpose of continuing production operation. This way of continuous flow-in deprives chances for thinking from information transferred side.

If by some chance or incident, the flow-in of new blueprints stops, yet the production must be continued or must be improved, then executives and technical staffs in transferred side are obliged to "think by themselves." This requires, for them, much more effort than before. Without this effort, their industry loses competitiveness and finally they will see the closure of their factory.

Such special effort can hardly be made unless there is an urgent or unavoidable situation. Japan experienced such stoppage in information supply in the last wartime which forced her to devise technical development by herself. In only few cases we had success in getting final results. On the other hand, most of efforts made in wartime matured after the war. Good examples are optical industry and shipbuilding industry which showed a surprising growth in postwar time. Japanese aeronautical industry was defeated in 1945 completely but engineer trained in this industry created many new technologies, for instance, in high-speed railway "shinkansen."

6. Trigger Information

When the industry possesses a certain degree of advancement in technology, they do not need detailed information to begin a competition with the top runner.

Only an information on the success of development or even a news that they started development, is enough to initiate a parallel development work for the same or similar products. This kind of information is called a "trigger information"

This type of development or catch-up action is called "second runner technique." This was employed by many of Japanese industries in yesterday and is now in use by many NICS countries. Patent agreement is only necessary to avoid unpleasant trouble with the top runner and not to begin production.

Whenever we adopt second runner technique, it is only necessary, for the second runner, to look at top runner and examines his action and attitude so as to take measures as fast as possible. This is very effective to avoid wind pressure and minimize energy consumption. On the other hand, many Japanese industries are embarassing now because they have no more top runner before him and they become alone and uneasy in mind. The top runner must always suffer from this uneasiness in mind and wind pressure exerted on him (physically and socially).

Speaking of trigger information, a delay in discovering change in the top-runner is fatal, so we must be careful not to look over any symptom for the coming change in top runner's tactics. The second runner must have a long ear and keen nose to catch a trigger information. This means, an enterprise in such situation must have a high searching capability and an analyzing competency.

7. How Japanese Industry has been trained in Information

7.1 Patent Problems

Patents are essential for the fate of an enterprise. An enterprise must keep necessary patent right for its production. Suppose the top runner (target enterprise) is equipped with a specific patent (target patent). The second runner can be competitive only by

a. having patent right competitive to target patent. This is possible by 1) creating a competitive patent, or 2) by buying a competitive patent, or 3) by producing many peripheral patents around a target patent.

b. raising opposition to the target patent application. For this action, we need to show clear evidence(s) to the patent office. This activity requires a strong information competence in mobilizing the technical competence of the enterprise. Many of Japanese enterprises acquired this information search and analysis competence by the repetition of these activities.

7.2 Sensibility to New Trends

An enterprise must have a total image of technology in its own field. This requires the thorough understanding of science and technology with a dynamical attitude.

On the other hand, new information on the frontier in its special field must be brought without delay. Regular reception of news from four corners of the world, frequent visit to related organization, participation into technical meeting of various organizations and purchase of so many journals and reports as required. The rate of information expenditure against total R & D expenditure is 1 to 3 percent in advancing industries.

If the capability of a single enterprise is not enough, we must strengthen our capability by cooperation with friendly companies, with national organization or establishing a common information organization.

7.3 Overcoming Discouragement in Technical Matters

When we are receiving variety of information from outside, some people, especially intelligents is apt to become nervous and discouraged for the poor advancement of his own organization.

For this common weakness, we must 1)expect the success of our next generation, not of ourselves because we need long-term effort for the prosperity of our enterprise, industry and nation. Secondly 2) we must make effort in extending our small success to full-sized one and, at the same time, we must have calmness and coolness in judgement. 3) we must engage in problems that really force us or drive us to solve and never make choice by a simple reason that it is fasionable.

7.4 Information for Sales

For a salesperson, whether he belong to a manufacturer or to a dealer company, he must be keen to customer's preference or tendency in selecting goods. Everyone knows this important factor. The real problem is how to transmit these customer's information correctly and in time to manufacturer or manufacturing department. I will take up an example and show you how it is done in Japan.

In Japan you will find every home uses electric automatic rice-cookers and only very few uses traditional cooking pots. The electric rice-cookers produce steamed rice in silver white color at any taste as a housewife wishes. When this machine become very popular in Japan, manufacturers began to export it. Chinese population accepted it without any difficulty. When this is exported to Iran, Japanese salesman experienced difficulty that this machine is not favored by Iranians. Salesman on the spot examined the machine under test by Iranians and found no fault at all.

At last they found Iranians' taste for rice is different from that of Eastern Orientals. In Iran steamed rice with egg and lamb meat is a delicious dish for people there, but they need some part of rice be over-cooked in brownish color. Salesman reported soon this fact to manufacturing department in Japan.

Very soon designers in the factory tried to change the range of automatic control to produce over-cooked rice in required color. With this specification change the manufacturer succeeded in modifying their machine into a new rice-cooker à la iranienne and soon they had success in Middle East countries.

Japanese industry does not hesitate to change its product specification if there is client's request or need. On the other hand, in some other countries, all automobile manufacturers refuse to produce right handle cars for Japan and other countries. The reason is simple. They do not keep left in their country. This difference in attitude, I think, makes difference in business.

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Section: Special Libraries and their role in National Development

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Status and Prospects of Special Librarians and Information Specialists in Asia

by

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Special Libraries and their role in National
Development

Status and Prospects of Special Librarians and Information Specialists in Asia

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1 INTRODUCTION

The beginning of struggle for status is literally unknown to us. From the very beginning, with the acquisition of knowledge, wealth and power, growing tendency for having supramacy over others, and greater interest in own affairs and in the environment, human beings started to dominate others in many affairs that were within or beyond their own jurisdiction. This finally created many social classes or groups in the society, and largely contributed in the development of different professionalisms. During the past few decades, professionalism found its way to exist among different social classes or groups. Strong justifications have been put forward to place one particular profession on its own foot. Library science was no exception to this. Compared to other professions, library science was rather very late in getting its current status, inspite of the fact that it has a historical background in the social and cultural development.

The role of librarians has now gradually, but slowly, been recognized by the administration. In developed countries, the library profession is now comparable to other specialized professions. The situation is rather worse and very discouraging in many developing countries, particularly in some countries of Asia and Africa.

Asia has some 44 countries with considerable economic, social, cultural, and historical differences. It is not a homogenous, social, and cultural unit, any more than Europe is. Each country has specific developmental (industrial, technical, agricultural and social) problems.

There are several thousand research organizations and technical and specialized educational institutions in Asian countries. Many of these organizations and institutions do not have good libraries, and in some cases, no libraries at all. In general, budget is very inadequate to meet the users' needs. Foreign currency is a big problem; exhorbitant prices of reading materials hinder the growth of library collections. Services are mostly offered in a traditional way; modern technologies are rather a dream for many libraries, documentation and information centres. Most libraries and documentation centres do not have adequate space; many libraries lack skilled or qualified staff, and some do not have any staff at all. In many cases, clerical or research or teaching staff take care of the libraries. In some cases, non-professional persons direct libraries and documentation centres.

National policies relating to information services are also non-existent in many countries. Whatever national policies that exist are also not effectively implemented. Library associations were able to make little impact on the development of status of information services staff.

Status of librarians in most of the Asian countries is at stake. In many countries, library profession is still not considered by the administration to be compared with other specialized fields. Administrators and policy-makers are reluctant to give due status to the librarians. Library personnel receive low consideration when the question of improving their status is raised.

In this paper, attempts have, therefore, been made to highlight and discuss some problems relating to the status and prospects of special librarians, documentalists, and information specialists prevalent in Asia and to suggest some guidelines that may be useful in our efforts to solve some of the existing problems in the long run.

2 METHODOLOGY

While scanning different library and information science journals, documents, and books, unfortunately I could not find a single paper or document that soley deal with the status of librarians, documentalists, and information specialists, particularly in Asian countries. The situation prompted me to undertake a quick survey to know the existing status of Asian libraries, documentation and information centers and of their staff. Provision was made in the questionnaire to gather information on collections, activities performed, and the services offered. Attempts were also made to know the existing problems in raising status of information service personnel.

Questionnaires were distributed to 47 selected libraries, documentation, and information centres in 16 Asian countries. Eighteen questionnaires from 7 countries were received back. Many questionnaires were incomplete in the sense that important information was not supplied. Since only a few libraries, documentation and information centres participated in the survey, so the survey results should not be considered as the sole representation of the Asian picture in relation to the status and related problems.

3 RESULTS AND DISCUSSION

Table 1 lists those libraries, documentation and information centres that participated in this survey, and their collections are also shown in this table. Table 2 identifies the functions that are currently performed, and the services offered are shown in Table 3. Table 4 shows the availability of computer facilities and international links. Types of users are shown in Table 5. Table 6 lists the publications and a.v. materials, produced by these libraries, documentation and information centres. Staff strength and comparative status of the staff members (with other positions in the same organization) are shown in Tables 7 and 8 respectively.

The survey shows that the university librarians are rather fortunate in attaining their due status which is more or less comparable to other faculty members. Few specialized documentation and information centres were able to attain a considerable status, but for the rest, the situation is very discouraging and frustating. Some librarians are even enjoying a status equal to assistants or upper division clerks of the same organization.

A number of factors are responsible for the low status of librarians and documentalists. Importance of library information services is viewed in different perspectives at different levels. Illiterate people do not normally feel to get access to library services or information. Less educated people, if they have at all any need for library services or for information, do not use the facilities due to various reasons. Educated people, living in urban areas, more or less use the library services, if facilities are made available to them. The use of library service or information is, therefore, limited to selected groups of people who may not have enough opportunities to advocate for the improved status of library, documentation and information personnel.

The survey and my personal experiences point out to some problems that have been acting as bottlenecks in the development of the status of library, documentation and information staff of the Asian countries. These problems are briefly discussed below.

Mass illiteracy is a major factor in overall socioeconomic development of any country. Unless greater demand for library information services comes from the majority of the people, it is very usual that the library, documentation and information personnel may not get their due status. Special libraries, documentation and information centres are an integral part of the overall information system and cannot, therefore, be considered as an isolated or a separate issue. In general, mass illiteracy is ultimately responsible for poor recognition of the importance of information services, which has resulted in the poor recognition of the status of information service personnel. Poor status and low pay-scales have failed to attract the best talents to the profession. Poor performance by information service personnel having poor background have further lowered the position of information service personnel. Besides, in special libraries, particularly in scientific and technical libraries, although importance of library personnel is recognized, but inherent prejudice of the management people in most cases is responsible for not giving due status to the library personnel.

Poor working conditions and environment, lack of sufficient infrastructural facilities, absence of clear-cut promotion policies, lack of advanced training and continuing education, lack of adequate professional capabilities or effective initiatives by the professional associations, lack of motivation, lack of budgetary posts, particularly status, cadre service, perquisites and incentives, and non-recognition of skills - all are responsible for the low status of the library, documentation and information staff. There is a general misunderstanding/ignorance of the profession too.

It has been observed that due importance is not accorded to the information resources and services by the administrators, planners and policy-makers, who are responsible for the overall promotion of the people. The poor concept of this group about the role of the library, documentation and information services towards the socioeconomic development and promotion of mankind has been working as the stumbling block on the way of progress of resources development, specially in the development of manpower resources. As a result, the services to the potential users are seriously being hampered. The people in the administration are the key persons, who have greater role to play, and they need to be convinced for raising the status of library, documentation and information staff. There are problems too in convincing the administration staff.

Mobility of librarians, etc. are very limited in the Asian countries as the number of opportunities is limited, and the system is beauracratic (applications for posts outside must be forwarded through the head of organization). If the head of organization does not want to lose the librarian, he will refuse to forward the application or will state that the person cannot be released. So a librarian, who is good, cannot expect to get a better post/pay elsewhere.

Some other problems are: lack of recognition of a librarian as a professional and as an academic staff; lack of standards of professional services; absence of national library systems; lack of professional training in both home and abroad. Library still gets lower priority, and librarians are still treated as administrative personnel, except those engaged in teaching job. Non-availability of adequate qualified and skilled staff members, difficulty in attracting graduates with science or technical degrees to the library and information field (as a scientist, the career prospects are better than that accorded to library and information staff), and the importance of library and information work as an integral and essential part of research and development, etc. are also the issues that should be mentioned here.

5 RECOMMENDATIONS FOR IMPROVING STATUS OF LIBRARY, DOCUMENTATION AND INFORMATION PERSONNEL

5.1 Attraction of skilled and best talents to the profession: Serious efforts should be made to attract the best talents to the profession. This is only possible if attractive pay-scales and status are offered. The respondents of the survey strongly advocate that the staff should be given proper salaries and status comparable to other professional services/fields. Status could be upgraded through effective service and through proper planning.

5.2 Earning of professional respect: Library, documentation and information personnel through their services and scholarships are to prove that they are not mere custodians, but they have attained such specialty in information handing technologies that their help is essential for the research workers to pursue any information needed for their work. Professional respect is something one probably cannot expect to inherit, rather it is something one must earn individually.

5.3 Specialization in subject field: There should be enough opportunities for the librarians, documentalists, and information scientists to specialize in certain subject fields, and to attend conferences, seminars, and courses within their areas of specialization to keep themselves aware of the latest developments. Workshops and conferences should be arranged in rural and semi-urban areas for the development of library information services and to create adequate demand for information services from the grass-root level.

5.4 Development of technical skill: The library, documentation and information personnel must gain adequate experiences in automated information services. Adequate facilities for on-the-job and advanced training should be made for the operating staff. There should be enough facilities for staff members for in-service training on information storage and retrieval in well equipped/automated libraries in developed countries.

5.5 Formulation of standards: Standards relating to the status of library, documentation and information staff should be framed and established with full justifications, a promotion policy should be adopted, and a printed copy of these standards should be circulated among the concerned offices of different countries with a request to implement the established/recommended standards. The Parliament of each country should adopt a bill relating to the status of library, documentation and information personnel.

5.6 Comparative status: Librarians, documentalists, and information specialists should be given a particular status. Some examples are given below. Librarians of the university and other specialized educational institutions should get a status equal to faculty members. Heads of national libraries/documentation/information centres should get a status equal to the secretary of a ministry. Heads of specialized libraries/documentation/information centres, the scope of which is national in character, should get a status equal to a research director of the same organization. Heads of other libraries, the scope of which is limited to the organization itself, should get a status equal to the head of a division or department of the same organization.

5.7 Introduction of cadre service: Cadre service for entry into and for the staff of the government libraries/documentation/information centres should be introduced, like other professions/services.

5.8 Strengthening of activities of national and international associations: Activities of the national and international professional associations should further be geared up. National associations should take seriously the challenge of raising the status and should find ways and means to achieve due status and pay-scales through concerted efforts.

5.9 Formulation of status development committee: Each national association should have a high-powered committee to look into the matters relating to the status of library, documentation and information personnel, encourage the government and other concerned offices to give greater recognition to work done by the library, documentation and information personnel, to collect regularly data on the existing salaries, status structures, and on the actual conditions of personnel, and to prepare guidelines defining different categories of personnel and their appropriate education, role, status, and standards on minimum salaries, etc.

5.10 Formulation of IFLA national committee: 'IFLA national committee', like National Commission for Unesco, may be formed in each country to provide feedbacks and support to the national associations in their efforts to raise the status of library, documentation and information personnel. IFLA national committee may help make the national authorities aware of the role of library, documentation and information personnel as a valuable source of administrative and technical information, make aware of the professional, scientific and technical character and value of the tasks performed by librarians, documentalists, and information specialists, and encourage national authorities to improve the status of professionals and to attract and retain suitable and skilled personnel.

6 CONCLUSION

The question of status, career structures, and personnel planning is very important by any means or standards. A depressed career status in any of the information service professions may lead to lower standards and hence to poor performance. Studies concerning the status of library, documentation and information personnel are rare in Asian countries or at any rate do not find their way into professional literature on the subject. This dearth of information may be due to the fact that the status of library, documentation and information personnel could not yet be viewed in the proper perspective. Moreover, research into the problems of status is a field that remains to be explored or at any rate, it has received little attention uptill now. Although we have talked much about the status, but we wrote almost nothing. The issue needs immediate attention to bring the matter into light more effectively.

The question now remains to be answered — should we allow the problems identified in this paper to continue to prevail further? If yes, how long; if not, then what should be done? At any rate of judgement and fair deal, it has now become imperative to find effective ways and means to raise the status of library, documentation and information personnel. We must launch a strong movement to impress upon the administrators and policy-makers to raise our status. The national associations have a bigger role to play. If we fail to establish our rights firmly and to achieve our due status, our prospects are then uncertain. We should remember that our current efforts are in many respects responsible for determining the prospects for the future generation. This is undoubtedly a challenging job and exciting too.

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TABLE 1 - LIST OF 18 ASIAN LIBRARIES, DOCUMENTATION AND INFORMATION CENTRES PARTICIPATED IN THE SURVEY AND THEIR COLLECTIONS

	Libraries/Information Centres	No. of Books	No. of bound journals	No. of reprint documents	No. of A.V. materials	No. of current periodicals	No. of other materials
1	ESCAP Pop Info Sec, Thailand	10,600	109	2,900	200	463	4,500
2	Bangladesh Univ Eng Tech (BUET) Lib	86,000	12,000	500	-	212	-
3	Cent Ingetr Rur Dev Asia Pacific (CIRDAP) Bangladesh	4,800	350	3,519	187	150	-
4	Inst Post-Grad Med (IPGMR) Lib, Bangladesh	16,000	3,500	2,000	-	60	-
5	Bangladesh Inst Dev Stud (BIDS) Lib	70,000§		25,000	5,000	800	-
6	Nat Inst Chulera Ent Dis (NICED) Lib, India	1,000	3,000	250	-	156	-
7	Nat Hlth Lib Doc Cent (NHLDC), Bangladesh	11,000	15,000	4,000	110	218	-
8	Inst Med Res (IMR) Lib, Malaysia	10,000	10,000	10,000	100	300	-
9	Fam Welf Pop Edu Inst (FWPEI) Lib, India	100	25	100	80	19	-
10	Lib, Fac Med, Univ Indonesia	70,073	13,046	*	23	260	-
11	Bangladesh Agr Univ (BAU) Lib	120,000	15,000	-	397	451	-
12	Nehru Lib, Haryana Agr Univ (HAU), India	13,200	55,000	370	-	1,800	3,000
13	Gandhigram Inst Rur Hlth Fam Welf (GIRHRFW) Lib, India	8,459	1,200	500	-	-	-
14	Nat Agr Lib Doc Cent (NALDOC), Bangladesh	7,059	436	-	-	300	-
15	Kuwait Univ Lib Dept	434,367	6,551+	5,000	79,592	6,551	1,559
16	Pub, Lib Inf Div (Rubber Res Inst Malaysia) (RRIM)	21,000	42,000	10,200	1,000	600	-
17	Lib Res Inf Div, Nat Inst Hlth Res Dev (NIHRD), Indonesia	9,818	658	3,991	-	89	-
18	Lib Pub Br, Int Cent Diarrheal Dis Res, Bangladesh (ICDDR,B)	18,496§		10,316	350	468	15

§ figure includes both books and bound journals

* included in book collection

+ titles only

TABLE 2 - TYPES OF FUNCTIONS PERFORMED BY 18 ASIAN LIBRARIES, DOCUMENTATION AND INFORMATION CENTRES

	Libraries/ Information Centres	Acquisition	Catalog/ Classif.	Analysis/ Synthesis/ Repackaging	Repository of indigenous publ.	Organization of				Establishment of standards	Library statistics
						Workshops	In-service training	Demonstrations	Briefings		
1	ESCAP	a	a	a	-	b	a	-	a	-	-
2	BUET	a	a	-	-	-	a	-	-	-	a
3	CIRDAP	a	a	b	b	-	b	-	-	-	b
4	IPGMR	b	b	-	-	-	b	b	-	-	b
5	BIDS	a	a	a	a	b	b	b	b	a	a
6	NICED	a	a	a	a	b	-	b	b	-	a
7	NHLDC	a	a	a	a	a	a	a	a	a	a
8	IMR	a	a	a	a	b	b	a	a	-	-
9	FWPEI	-	-	-	a	-	a	a	-	-	-
10	Univ Indonesia	a	a	b	-	b	a	-	b	-	a
11	BAU	a	a	-	a	-	-	b	b	b	b
12	HAU	a	a	a	-	-	-	-	-	-	a
13	GIRHRFW	a	a	b	b	b	b	b	b	b	b
14	NALDOC	a	a	a	a	a	a	b	a	a	a
15	Kuwait Univ	a	a	b	-	-	a	a	a	a	a
16	RRIM	a	a	-	-	-	a	a	b	b	b
17	NIHRD	a	a	b	b	b	b	b	b	b	a
18	ICDDR,B	a	a	a	b	b	b	a	a	-	a

a = major; b = minor; - = no function performed.

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TABLE 3 - TYPES OF SERVICES OFFERED BY 18 ASIAN LIBRARIES, DOCUMENTATION AND INFORMATION CENTRES

	Libraries/ Information Centres	Readers' service	Ref. Interview	Q & A	SDI	CAS	check	Literature search		Refer- ence	Network		Union Cat.	Reprint supply	Photo- copy	Microfiche/ Microfilms	Coop acqn	Index/ Abstract
								Manual	On-line		Nat.	Intl.						
1	ESCAP	a	b	-	a	a	a	-	a	-	a	a	-	-	a	b	-	a
2	BUET	a	b	a	-	a	b	b	a	-	-	-	-	a	a	b	b	b
3	CIRDAP	a	-	a	b	b	-	b	-	a	b	a	a	b	a	-	-	b
4	IPGMR	a	b	a+b	-	-	b	-	a	b	b	-	-	-	-	-	b	b
5	BIDS	a	b	a	a	a	a	a	-	a	a	a	b	-	a	a	a	a
6	NICED	a	a	a	b	b	b	a	a	a	a	a	a	a	a	-	b	b
7	NHLDC	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
8	IMR	a	a	a	a	a	a	a	a	a	a	a	b	b	a	-	b	a
9	FWPEI	a	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-
10	Univ Indonesia	a	a	-	b	a	a	a	b	a	a	a	a	-	a	-	b	a
11	BAU	b	-	b	-	b	b	b	-	a	b	-	b	b	b	-	-	-
12	HAU	a	a	a	-	a	a	a	-	a	-	-	a	a	-	-	-	-
13	GIRHRFW	a	a	a	a	-	-	a	b	a	b	b	-	-	-	-	-	b
14	NALDOC	a	a	a	a	a	a	a	-	a	a	a	a	a	a	a	b	a
15	Kuwait Univ	a	b	a	a	a	a	b	a	-	-	a	a	b	a	a	-	b
16	RRIM	a	a	a	a	a	b	b	a	a	b	-	-	b	b	b	-	b
17	NIHRD	b	b	b	b	-	a	a	-	a	a	b	a	b	a	-	b	a
18	ICDDR,B	a	a	a	a	a	a	a	a	a	b	b	-	a	a	a	b	a

a = major; b = minor; - = no service available.

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TABLE 4 - AVAILABILITY OF COMPUTER FACILITIES, AND FACILITY FOR INTERNATIONAL LINKS IN ASIAN LIBRARIES, DOCUMENTATION AND INFORMATION CENTRES

	Libraries/ Information Centres	Availability of Computers	International Links	Remarks
1	ESCAP	Y	Y*	* POPIN
2	BUET	-*	-§	* Microcomputer planned; § AIT
3	CIRDAP	Y*	-§	* TRS 180 and Radio Shake 16 § with FAO, and ESCAP
4	IPGMR	-	-	-
5	BIDS	-	Y§	§ DEVSIS, IDRC
6	NICED	-	-	-
7	NHLDC	-	Y*	§ HELLIS of WHO-SEARO
8	IMR	Y	Y*	§ SEAMIC, and WHO-WPRO
9	FWPEI	-	-	-
10	Univ Indonesia	-*	Y§	* Planned; § SEAMIC, HELLIS, ICDDR,B and MCR-TROPMED
11	BAU	-	Y§	§ AGRIS
12	HAU	-	-	-
13	GIRHRFW	-	-	-
14	NALDOC	-	Y§	§ AGRIS, CARIS, NFIS, AIBA, CABI, ISNAR AND SAARC
15	Kuwait Univ	-*	Y	* Planned
16	RRIM	Y	-	-
17	NIHRD	-	Y§	§ HELLIS and HSR Info System of WHO-SEARO, and SEAMIC
18	ICDDR,B	Y*	Y§	* IBM-PC/XT; § DISC, ESCAP, and AIT

TABLE 5 - TYPES OF USERS AND THEIR ACCESS TO LIBRARY INFORMATION SERVICE FACILITIES

	Libraries/ Information Centres	Administrators	Policy makers/ planners	Researchers	Technicians	Teachers	Students	General public	Children	Aged people	Others
1	ESCAP	y	y	y	y	y	y	y	-	-	y[+]
2	BUET	-	-	y	-	y	y	-	-	-	-
3	CIRDAP	y	y	y	y	-	y	-	-	-	-
4	IFPMR	y	-	y	y	y	y	-	-	-	-
5	BIDS	y	y	y	y	y	y	-	-	-	-
6	NICED	-	y	y	y	-	-	-	-	-	-
7	NHLDC	y	y	y	y	y	y	y	-	-	-
8	IMR	y	y	y	y	y	y	-	-	-	-
9	FWPEI	-	-	-	-	y	y	-	-	-	-
10	Univ Indonesia	-	y	y	-	y	y	-	-	-	-
11	BAU	-	-	y	-	y	y	-	-	-	y
12	HAU	y	y	y	y	y	y	y	-	y	-
13	GIRHRFW	y	y	y	y	y	y	-	-	-	-
14	NALDOC	y	y	y	y	y	y	-	-	-	-
15	Kuwait Univ	y	y	y	y	y	y	-	-	-	y[§]
16	RRIM	y	y	y	y	y	y	-	-	-	-
17	NIHRD	y	y	y	y	-	y	-	-	-	-
18	ICDDR,B	y	y	y	y	y	y	-	-	-	y

y indicates that the particular category of user has access to library facilities.
- indicates that the particular category of user does not have access to library facilities.
+ refers to UN agency staff members.
§ refers to disabled persons.

TABLE 6 - TYPES OF PUBLICATIONS AND AV MATERIALS PRODUCED BY 18 ASIAN LIBRARIES, DOCUMENTATION AND INFORMATION CENTRES

	Libraries/ Information Centres	CAB	Inf. Bulletin	Acquisition List	Natl. Bib.	Specialized Annotated Bib.	Bib./Index/ Directory	News-letter	Index/ abstract	Periodical holdings list	Journal	Union Cat.	Short/ Select Bib.	A.V. mater-ials	Oth
1	ESCAP	y	y	y	-	y	y	y	y	y	y	-	y	-	y
2	BUET	y	-	y	-	y	-	-	-	-	-	-	-	y	-
3	CIRDAP	-	y	y	y	y	y	y	-	y	-	y	y	y	-
4	IPGMR	y	-	-	-	-	-	-	-	y	y	y	-	-	-
5	BIDS	y	-	y	-	y	-	y	y	y	-	y	y	-	-
6	NICED	-	-	-	y	y	-	-	-	-	-	y	y	-	-
7	NHLDC	y	-	y	y	-	y	-	y	y	-	y	y	y	-
8	IMR	y	y	y	y	y	y	-	y	y	-	-	-	-	y
9	FWPEI	-	-	-	-	-	-	-	-	-	y	-	y	-	-
10	Univ Indones	-	-	y	-	-	-	y	-	y	-	-	y	-	y
11	BAU	y	-	y	-	-	-	-	-	y	-	-	-	-	-
12	HAU	y	y	y	-	y	y	y	y	y	y	y	y	-	-
13	GIRHRFW	-	-	-	-	-	-	y	-	y	-	-	y	y	-
14	NALDOC	y	y	y	y	y	y	y	y	y	y	y	y	-	-
15	Kuwait Univ	-	-	y	-	-	y	-	y	y	-	y	y	y	y
16	RRIM	y	y	y	-	y	y	-	-	y	-	-	y	y	-
17	NIHRD	-	-	y	y	y	y	y	y	y	y	-	-	-	-
18	ICDDR,B	y	-	y	-	y	y	y	y	y	y	-	y	y	y

y = yes; - = no.

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TABLE 7 - STAFF STRENGTH OF 18 ASIAN LIBRARIES, DOCUMENTATION AND INFORMATION CENTRES

	Libraries/Information Centres	No. of professional staff	No. of non-professional staff	No. of other staff	Total
1	ESCAP	9	13	-	22
2	BUET	9	17	12	38
3	CIRDAP	4	2	2	8
4	IPGMR	5	9	-	14
5	BIDS	10	5	2	17
6	NICED	3	2	-	5
7	NHLDC	7	6	21	34
8	IMR	1	1	6	8
9	FWPEI	1	5	2	8
10	Univ Indonesia	4	10	5	19
11	BAU	13	34	31	78
12	HAU	9	17	54	80
13	GIRHRFW	2	-	1	3
14	NALDOC	9	15	-	24
15	Kuwait Univ	37	187	32	256
16	RRIM	5	13	-	18
17	NIHRD	5	18	8	31
18	ICDDR,B	5	5	2	12

TABLE 8 - STATUS OF ASIAN LIBRARY, DOCUMENTATION AND INFORMATION STAFF COMPARED TO OTHER POSITIONS IN SAME ORGANIZATION

	Libraries/ Information Centres	Titles of position of senior Lib. doc. and inf. staff	Equivalent positions
1	ESCAP	Chief	-
2	BUET	Librarian Deputy Librarian Asstt Librarian	Professor (almost) Assoc Professor Asstt Professor
3	CIRDAP	Documentation Officer Asstt Doc Officer Librarian	-
4	IPGMR	Librarian	Asstt Professor
5	BIDS	Chief Librarian Librarian Sr Doc Officer	Research Fellow Research Assoc Research Assoc
6	NICED	Librarian-in-Charge Librarian Librarian (II)	Research Asstt Research Asstt U.D. Clerk/Jr Stenographer
7	NHLDC	Chief Librarian Asstt Librarian	Asstt Director of Health Services Medical Officer of Health Services
8	IMR	Librarian	Scientist
9	FWPEI	Librarian	Asstt
10	Univ Indonesia	Head Librarian	-
11	BAU	Librarian Deputy Librarian Asstt Librarian	Between Professor & Assoc Prof. Between Assoc Prof. & Asstt Prof. Between Asstt Prof. & Lecturer
12	HAU	Librarian Deputy Librarian Asstt Librarian	Professor Assoc Professor Asstt Professor
13	GIRHRFW	Librarian Documentalists	Upper Division Clerk Upper Division Clerk
14	NALDOC	Director Asstt Director Sr Sci Officer	Director Asstt Director Sr Sci Officer
15	Kuwait Univ	Director Deputy Director Head of Technical Dept	Director Deputy Director Head of Technical Dept
16	RRIM	Librarian Sr Asstt Librarian Asstt Librarian	Sr Res Officer Sr Res Officer Research Officer
17	NIHRD	Head Librarian	-
18	ICDDR,B	Branch Head Librarian Serial Librarian	Assoc Scientist Sr Research Officer Sr Research Officer